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Angraecum jamboe Rumph., which I formerly identified with *Dendrobium pruinosum* T. et B. and which Doctor Robinson thought to be *Pseuderia foliosa* Schltr., is probably neither of these species. In fact Rumphius's description of *Angraecum jamboe* suits entirely neither *Pseuderia foliosa* nor *Dendrobium pruinosum,* but it seems rather certain that he had in mind a species of *Dendrobium* of the section *Grastidium.*

I repeat here the Rumphian species, which are represented in the Robinson collection.

Platanthera Susannae Lindl.=*Flos Susannae* Rumph.
Habenaria Rumphii Lindl.=*Orchis amboinica minor* Rumph.; *Flos Susannae minor* Rumph.
Anoectochilus Reinwardtii Bl.=*Folium petolatum femina s. vera* Rumph.
Zeuxine amboinensis J. J. Sm.=? *Folium petolatum mas* Rumph.
Coelogyne Rumphii Lindl.=*Angraecum nervosum* Rumph.
Calanthe veratrifolia R. Br.=*Flos triplicatus* Rumph.
Spathoglottis plicata Bl.=*Angraecum terrestre primum purpureum* Rumph.
Dendrobium papilioniferum J. J. Sm.=*Angraecum crumenatum* Rumph.
Dendrobium ephemerum J. J. Sm.=*Angraecum album minus* Rumph.
Dendrobium moluccense J. J. Sm.=*Herba supplex minor* Rumph.
Dendrobium purpureum Roxb.=*Angraecum purpureum silvestre* Rumph.
Grammatophyllum scriptum Bl.=*Angraecum scriptum* Rumph.
Phalaenopsis amabilis Bl.=*Angraecum album majus* Rumph.
Luisia confusa Reichb. f.=*Angraecum flavum decimum s. angustifolium* Rumph.
Renanthera moluccana Bl.=*Angraecum rubrum* Rumph.

PAPHIOPEDILUM Pfitzer

PAPHIOPEDILUM MASTERSIANUM Pfitz. in Engl. Bot. Jahrb. 19 (1894) 40.

AMBOINA, cultivated by a native at Asiloeloe, *Reliquiae Robinsonianae 1619,* October 5, 1913.

PLATANTHERA L. C. Richard

PLATANTHERA SUSANNAE (Linn.) Lindl. Gen. et Sp. Orch. (1835) 295.
Flos susannae Rumph. Herb. Amb. 5: 286, *t. 99.*

AMBOINA, Soja road and Way tommo, *Robinson Pl. Rumph. Amb. 9,* August 1 and 9, 1913. Terrestrial, on grassy hillsides, altitude 20 to 150 meters.

PLATANTHERA ROBINSONII sp. nov.

Folia radicalia petiolata, lanceolata, breviter acuminata, acuta, margine minute undulata, costa media dorso prominente, nervis 2, majoribus et 2–3 tenuioribus utrinque, oblique reticulato-venosa, c. 7 cm longa, 2.1 cm lata, petiolo c. 4 cm longo. Inflorescentia erecta, laxe pluriflora, pedunculo c. 28 cm vel plus longo,

inferne folium erecto-patens foliis radicalibus simile sed vagina c. 1.5 cm longa instructum ceterum vaginulas c. 6–7 foliaceas patentes ovato-lanceolatas acute acuminatas marginibus et costa media decurrentes superne decrescentes et in bracteas vergentes gerente, rachide elongata, sicco angulata, glabra. Bracteae ovatae, sensim longius acuminatae, acutiusculae, concavae, basi 1-, supra basin 5-nerviae, ad c. 1.3 cm longae, 0.43 cm latae. Flores c. 9–14, toti c. 1.25 cm longi. Sepalum dorsale erectum, ovatum, apice conduplicatum, obtusum, concavum, 3-nervium, costa media dorso prominente, nervis exterioribus brevibus tenuibusque, c. 0.46 cm longum, 0.325 cm latum. Sepala lateralia patentissima, superne oblique recurva, oblique lineari-oblonga, basi subfalcatula, obtusa, margine apicali incurva, convexa, nervo intermedia dorso prominente, c. 0.55 cm longa, 0.15 cm lata. Petala erecta, semiovato-oblonga, supra basin acuminato-angustata, obtusa, basi lata concavula, 2-nervia, nervo antico inconspicuo, bene 0.5 cm longa, basi 0.225 cm lata. Labellum deflexum, simplex, ligulatum, apicem versus sensim leviter angustatum, obtusum, 5-nervium, c. 0.65 cm longum, basi 0.15 cm latum; calcar dependens, inferne ovario adpressum, incurvum, laminam superans, teres, obtusum, c. 0.775 cm longum. Gynostemium c. 0.225 cm longum, auriculis parvis verruculosis. Anthera brevis, latissima, apice late excisa, thecis valde remotis, parvis, clavatis. Ovarium 6-sulcatum, c. 1.3 cm longum.

AMBOINA, Mount Salahoetoe, *Reliquiae Robinsonianae 1639*, November 27, 1913. Terrestrial, altitude 850 meters; flowers greenish.

The plant seems to be closely allied to *Platanthera halconensis* (Ames) Schltr., from which it differs in its smaller flowers; blunt lateral sepals; and differently shaped petals. The basal leaves of *P. halconensis* are still unknown.

PERISTYLUS Blume

PERISTYLUS CANDIDUS J. J. Sm. Fl. Buit. 6 (1905) Orch. 36.

AMBOINA, Soja road, *Reliquiae Robinsonianae 1625*, August 1, 1913. Terrestrial, altitude 200 to 300 meters; flowers white; basal leaves usually four.

HABENARIA Willdenow

HABENARIA RUMPHII Lindl. Gen. et Sp. Orch. (1835) 320.

Orchis amboinica minor Rumph. Herb. Amb. 6: 118, *t. 54, f. 2.*
Flos susannae minor Rumph. op. cit. 5: 287.

AMBOINA, Soja road, *Robinson Pl. Rumph. Amb. 11*, August 1, 1913. Terrestrial, on grassy hillsides, altitude 100 to 300 meters.

HABENARIA AMBOINENSIS sp. nov.

Caulis erectus, c. 40 cm longus, inferne vaginis tubulosis tectus, superne foliatus. Folia c. 10, basin caulis versus in vaginas vergentia, superne decrescentia, erecto-patentia, lanceolata, acuta, longe mucronata, basi angustata, costa media dorso carinata, reticulato-venosa, ad c. 12.5 cm longa, 2.3 cm lata; vaginae tubulosae. Inflorescentia erecta laxe c. 13-flora, secunda (?), pedunculo c. 11 cm longo, vaginulis c. 6–7 erectis laxe adpressis foliaceis superne decrescentibus et in bracteas vergentibus lanceolatis longe acuminatis donato, rachide c. 10 cm longa. Bracteae erectae, lanceolatae, longissime et acutissime acuminatae, concavae, margine minutissime papillosae, nervis 3 majoribus, costa media dorso prominente, reticulato-venosae, ad c. 4 cm longae, c. 0.77 cm latae. Flores erecti, toti c. 3 cm longi. Sepalum dorsale erectum, galeiforme, marginibus apiceque recurvum, subovatum, sensim angustatum, obtusum, nervis 3 dorso prominentibus, c. 1.1 cm longum. Sepala lateralia divergentia, oblique ovato-lanceolata, apicem versus sensim angustata, anguste obtusa, medio concavo-depressa, nervis 3 dorso prominentibus, c. 1.2 cm longa, 0.4 cm lata. Petala a sepalo dorsali libera, profunde bipartita, lacinia postica erecto-patente cum sepalo intermedio angulum acutum faciente, recta, lineari-subulata, acutiuscula, 2-nervia, usque ad basin c. 1.15 cm longa, basi 0.3 cm lata, lacinia antica longiore, arcuato-adscendente, lineari-filiformi, acuta, nervo 1 a nervo antico laciniae posticae emisso, c. 1.5 cm longa, supra basin 0.06 cm lata. Labellum alte 3-partitum, reflexum, laciniis lateralibus patentissimis, incurvis, filiformibus, c. 1.65 cm longis, vix 0.03 cm latis, lacinia intermedia deflexa, superne incurvula, lineari, convexa, nervia, c. 1.8 cm longa, 0.1 cm lata; calcar deorsum spectans, rectum, infra medium inflatum, apicem versus sensim attenuatum, acutum, c. 2.1 cm longum. Gynostemium cum processibus stigmatis c. 0.6 cm longum, auriculis majusculis, verruculosis. Anthera erecta, apice retusa, dorso convexa, thecis parallelis, clavatis, canalibus porrectis. Rostelli lobus intermedius erectus, triangulus, thecis multo brevior; crura porrecta, linearia, canaliculata. Processus stigmatici decurvi, basi labelli adpressi, oblongi, obtusi, convexi, crura rostelli subaequantes. Ovarium breviter petiolatum, curvulum, 6-sulcatum, c. 1.9 cm longum, pedicello c. 0.3 cm longo.

AMBOINA, Hatiwe, *Robinson Pl. Rumph. Amb. 14*, September 15, 1913, in light forests, altitude 250 meters. Flowers green, the column white.

The nearest allies of this species are probably *Habenaria dracaenifolia* Schltr., *H. keyensis* Schltr., and *H. bantamensis* J. J. Sm. The specimen does not represent any of the species described by Rumphius as Doctor Robinson supposed.

The plant differs from *H. dracaenifolia* in its smaller leaves, hardly acuminate sepals, the petals not cohering with the dorsal sepal, and provided with a short enterior lacinia, shorter lateral lobes, and the spur

dilated above the base and longer than the ovary; from *H. epiphylla* by its smaller leaves, broader dorsal sepal, the posterior lacinia of the petals straight and the anterior one shorter, and shorter lobes of the lip; from *H. bantamensis* by the broader gradually narrowed leaves, more numerously flowered spike, the sepals not acuminate, the petals with a shorter and broader posterior lacinia, shorter and unequal lobes of the lip, a longer spur, and smaller staminodes; and from *H. keyensis* Schltr. by the lateral sepals not being acuminate, the longer anterior lacinia of the petals, the shorter lacinia of the lip, the longer straight spur, and the stigmata nearly equaling the anther canals in length.

Doctor Robinson suggested in his field notes, that the plant might be *Orchis amboinica minor altera* Rumph. Herb. Amb. 6: 118, *t. 54, f. 3.* This, however, certainly is not the case. Rumphius's plate represents a plant with broader leaves and much smaller flowers, while his description does not at all suit Robinson's plant. Rumphius's figure represents a species of *Peristylus.*

The species belongs to the *Salaccensis* section.

DIDYMOPLEXIS Griffith

DIDYMOPLEXIS MINOR J. J. Sm. in Bull. Inst. Bot. Buit. 7 (1900) 1, var. **AMBOINENSIS** J. J. Sm. var. nov.

Plantae quam specimina javanica paulo robustiores. Labellum apice longius lacinulatum.

AMBOINA, Way tommo, *Reliquiae Robinsonianae 1638,* August 19, 1913, in sandy places on river banks, altitude 100 meters. Flowers pale-violet and white, the tip of the column brown.

The species has been recorded from Java and New Guinea. The variety collected in Amboina by Robinson differs chiefly in the longer toothed labellum.

ANOECTOCHILUS Blume

ANOECTOCHILUS REINWARDTII Blume Fl. Jav. Orch. (1858) 40, *t. 12, f. 2; t. 12b, f. 14.*

Folium petolatum II femina s. vera Rumph. Herb. Amb. 6: 93, *t. 41, f. 3.*

AMBOINA, Hitoe lama, *Robinson Pl. Rumph. Amb. 16,* November 5, 1913, from cultivated plants originating in the neighboring hills.

ANOECTOCHILUS ? sp.

AMBOINA, foothills of Mount Salahoetoe, *Robinson Pl. Rumph. Amb, 17,* November 27, 1913, sterile. Terrestrial, altitude 200 meters.

The leaves resemble those of the preceding species.

ZEUXINE Lindley

ZEUXINE AMBOINENSIS J. J. Sm. in Ic. Bog. 2 (1905) 259.

Folium petolatum mas Rumph. Herb. Amb. 6: *t. 41, f. 2* ?

AMBOINA, Way uri, *Reliquiae Robinsonianae 1916,* September 9, 1913, altitude 25 meters. Terrestrial in river bottoms.

Doctor Robinson describes the flowers as white; in the dried specimens the sepals are light green.

HETAERIA Blume

HETAERIA OBLONGIFOLIA Blume Bijdr. (1825) 410; Tabel. *f. 14.*

AMBOINA, Hitoe messen, *Reliquiae Robinsonianae 1629*, altitude 150 meters. Terrestrial on lime stone, the flowers white.

Not previously recorded from Amboina.

GOODYERA R. Brown

GOODYERA RUBICUNDA Lindl. in Bot. Reg. (1839) 92, var. **AMBOINENSIS** J. J. Sm. var. nov.

Caulis e basi decumbente radicante adscendens, validus, c. 10–foliatus, c. 47 cm longus. Folia petiolata, oblique elliptica ad oblanceolato-elliptica, triangulo-angustata, acuminata, acuta, basi sensim longe acuminata, curvinervia, costa media dorso prominente, oblique reticulato-venosa, sicco membranacea, c. 9–17.5 cm longa, 3.85–5 cm lata; petiolus canaliculatus, basi dilatatus, cum vagina tubulosa c. 5.5–7.5 cm longus. Inflorescentia erecta, elongata, laxe multiflora, pedunculo c. 31 cm longo, superne pubescenti, vaginulis c. 7 foliaceis basi tubulosis adpressis superne decrescentibus et in bracteas vergentibus donato, rachide longius glanduloso pubescenti, c. 25 cm longa. Bracteae ovato-lanceolatae, sensim longe acuminatae, concavae, pubescentes, 1-nerviae, ad c. 1.8 cm longae. Flores quaquaversi, patentes, deinde patentissimi, c. 1.25 cm lati, 0.73 cm longi, sepalis patentissimis, dorso glanduloso-pubescentibus. Sepalum dorsal erectum, ovato-oblongum, sensim angustatum, obtusum, concavum, 3-nervium, c. 0.65 cm longum, 0.26 cm latum. Sepala lateralia divaricata, oblique oblonga, dimidio superiore angustata, anguste obtusa et apice canaliculata, 3-nervia, c. 0.625–0.66 cm longa, 0.27–0.3 cm lata. Petala sepalo dorsali agglutinata, oblique spathulata, ex ungue lineari superne dilatato plus minusve abrupte in laminam rhombeam obtusam dilatata, 1-nervia, c. 0.65 cm longa, 0.17 cm lata. Labellum erectum, inferne marginibus gynostemio adpressum, valde ventricoso-concavum, subtus longitudinaliter sulcatum, basi lata oblique subsaccata affixum, apice abrupte contractum recurvumque, 5-nervium, explanatum suborbiculare, margine antico excepto carnoso-incrassatum et intus dense muricibus mollibus obtectum, apice abrupte in appendicem triangulo-oblongam obtusam contractum, totum c. 0.57 cm longum, 0.475 cm latum, appendice c. 0.15 cm longa. Gynostemium vix curvulum, clavatum, basi tenue et subtus longitudinaliter costatum, c. 0.5 cm longum, clinandrio magno, alte excavato, ovato, quam dimidium gynostemii breviore. Anthera erecta, basi in clinandrium immersa, oblongo-triangula, sensim acuminata, apice recurvula, acuta, basi truncata biloba, lobis

retusis, connectivo convexo, c. 0.26 cm longa. Rostellum porrectum, bifidum, laciniis anguste triangulis, subfalcatulis. Stigma clinandrio minus, margine recurvulum, basi truncatum. Ovarium sessile, glanduloso-pubescens, c. 0.775 cm longum.

AMBOINA, Mahija, *Reliquiae Robinsonianae 1615*, August 12, 1913. Terrestrial, altitude 150 meters. Flowers white and yellow.

This variety differs from Blume's description and figure in the longer and denser inflorescence with smaller and more spreading flowers, the more spathulate petals, broader lip with a shorter blunt apical lobe, and the shorter anther. The details of Blume's figure however need correction.

COELOGYNE Lindley

COELOGYNE RUMPHII Lindl. Fol. Orch. Coel. (1854) 14.

Angraecum nervosum Rumph. Herb. Amb. 6: 106, *t. 48.*

AMBOINA, Soja and Bato merah, *Robinson. Pl. Rumph. Amb. 7*, August 24 and 31, 1913, altitude 150 and 300 meters.

PLOCOGLOTTIS Blume

PLOCOGLOTTIS LOWII Reichb. f. in Gard. Chron. (1865) 434.

AMBOINA, Mount Salahoetoe, *Reliquiae Robinsonianae 1618*, November 27, 1913. On ridges, altitude 300 meters; the sepals greenish-lilac, the petals greenish.

CALANTHE R. Brown

CALANTHE VERATRIFOLIA R. Br. in Bot. Reg. 9 (1823) *t. 270.*

Flos triplicatus Rumph. Herb. Amb. 6: 115, *t. 52, f. 2.*

AMBOINA, Koesoekoesoe sereh, *Robinson Pl. Rumph. Amb. 10*, August 7 and 23, 1913. Terrestrial, altitude 200 meters; flowers white.

SPATHOGLOTTIS Blume

SPATHOGLOTTIS PLICATA Blume Bijdr. (1825) 401; Tabel. *f. 76.*

Angraecum terrestre primum purpureum Rumph. Herb. Amb. 6: 112 (excl. fig.).

AMBOINA, town of Amboina, Soja road, Batoe gadjah, and Hitoe messen, *Robinson Pl. Rumph. Amb. 15, Reliquiae Robinsonianae 1628*, July, August, and November, 1913. Terrestrial, altitude 10 to 150 meters.

This plant is not *Angraecum terrestre alterum* Rumph. Herb. Amb. 6: 113, *t. 50, f. 3*, but as I formerly pointed out (Orch. Amb. 25) is *Angraecum terrestre primum purpureum* Rumph.

MICROSTYLIS Nuttall

MICROSTYLIS ? VENTILABRUM Reichb. f. in Gard. Chron. 16 (1881) 717.

AMBOINA, Mahija, *Reliquiae Robinsonianae 1614*, August 7, 1913, altitude 250 meters. Terrestrial, in humus, the flowers yellow, turning brown, then red; fruit green; leaves purplish-green.

As Reichenbach's description of this species is insufficient, the identity of Robinson's specimen is not certain.

PSEUDERIA Schlechter

PSEUDERIA FOLIOSA Schltr. Orch. Deutsch Neue-Guinea (1912) 644.

Dendrobium foliosum Brongn. Bot. Voy. Coq. 203, *t. 41.*

AMBOINA, Gelala and Hoetoemoeri road, *Robinson Pl. Rumph. Amb. 18*, September 19 and 30, 1913, altitude 300 meters. Terrestrial and climbing on trees.

DENDROBIUM Swartz

DENDROBIUM PAPILIONIFERUM J. J. Sm. Orch. Amb. (1905) 42.

Angraecum crumenatum Rumph. Herb. Amb. 6: *t. 47, f. 2.*

AMBOINA, Wakal, *Robinson Pl. Rumph. Amb. 15*, November, 1913, on *Sonneratia* trees along the seashore. Flowers white, the tips of the sepals and petals pale-lilac; lip mainly white below the constriction, lilac beyond, the central thickening yellow on the margins, about 8 lilac veins on each side below the constriction, faint, branched, extending to the margin.

This plant is not, as Doctor Robinson suggested, *Angraecum album minus* Rumph. Herb. Amb. 6: 99, *t. 44, f. 1,* which has white flowers.

DENDROBIUM EPHEMERUM J. J. Sm. in Merr. Interpret. Herb. Amb. (1917) 174.

Dendrobium papilioniferum J. J. Sm. var. *ephemerum* J. J. Sm. Orch. Amb. (1905) 45.

Angraecum album minus Rumph. Herb. Amb. 6: 99, *t. 44, f. 1.*

AMBOINA, Hitoe lama, *Robinson Pl. Rumph. Amb. 19*, November 5, 1913, altitude 75 meters.

Robinson suggested that this specimen represented *Angraecum sextum moschatum* Rumph., but the Rumphian species is *Dendrobium rumphianum* T. & B.

DENDROBIUM MOLUCCENSE J. J. Sm. in Bull. Jard. Bot. Buit. 13 (1914) 11.

Dendrobium atropurpureum J. J. Sm. (nec Miq.) Orch. Amb. (1905) 54.

Herba supplex minor Rumph. Herb. Amb. 6: 110, *t. 50, f. 2.*

AMBOINA, Roemah tiga, *Robinson Pl. Rumph. Amb. 17*, July 20, 1913. On trees, usually *Calophyllum inophyllum*, at sea level, the flowers very dark red.

DENDROBIUM ACUMINATISSIMUM Lindl. Gen. et Sp. Orch. (1830) 86.

AMBOINA, Paso, *Reliquiae Robinsonianae 1622*, October 13, 1913, epiphytic, on trees near the beach.

The specimen may represent the var. *papuanum* J. J. Sm., but the flowers are withered.

DENDROBIUM CONSANGUINEUM sp. nov.

Rhizoma breve, repens, ramosum, radicibus crassis. Caules approximati, basi incrassati, foliati, c. 50 cm longi, internodiis ad c. 2 cm longis. Folia patentissima, oblongo-ovata, apicem versus angustata, valde oblique obtuse bidentata, basi rotundata,

carnosa, nervis sicco supra prominentibus, ad c. 4.75 cm longa, 1.9 cm lata (sicco) ; vaginae tubulosae, sicco prominenter nervosae, dense verruculosae, internodia aequantes. Inflorescentiae vaginam dorso ad basin perforantes, patentes, abbreviatae, 2-florae, pedunculo c. 0.6–0.8 cm longo, basi nonnullis vaginulis lateraliter compressis semioblongis rotundatis ad c. 0.2–0.3 cm longis cincto. Flores minusculi. Sepalum dorsale anguste oblongum, obtusum, breviter crasse obtuse conico-apiculatum, valde concavum, 1-nervium, laxe reticulatato-venosum, bene 1.2 cm longum, 0.35 cm latum. Sepala lateralia cum pede gynostemii mentum conicum obtusum cum ovario angulum acutum faciens formantia, antice basi brevissime connata, basi in laciniam oblique oblongum dilatata, oblongo-triangula, falcata, apice dorso incrassata, obtusa, concava, 3-nervia, costa media dorso incrassata, bene 1 cm longa, basi 0.8 cm, supra basin 0.43 cm lata. Petala lanceolata, falcata, anguste obtusa, dorso ad apicem incrassata, concava, 3-nervia, c. 0.97 cm longa, 0.225 cm lata. Labellum erectum, apice recurvum, concavum, simplex, spathulatum, 5-nervium, papillosum, explanatum c. 1.15 cm longum, ungue lineari, bicostato, lamina rhombea, apice contracta, obtusa, margine irregulariter sublaciniata, medio callifera, c. 0.35 cm lata. Gynostemium absque anthera c. 0.2 cm longum, apice triangulo, auriculis aequilongis, triangulis, subacutis, appendice lineari apice dilatata obtuse conduplicato-biloba fere 0.2 cm longa infra stigma. Anthera cucullata, basi biloba, apice late rotundato-truncata, antice convexa cum costula longitudinali, bene 0.1 cm lata. Pes gynostemii cum ovario angulum acutum faciens, rectus, linearis, c. 0.6 cm longus. Ovarium 6-sulcatum, cum pedicello c. 0.90 cm longum.

AMBOINA, Wakal, *Reliquiae Robinsonianae 1630, 1624*, November 5 1913, at sea level. Flowers in pairs, yellow, the sepals and petals within with lilac spots in lines; lip pure white; column whitish-lilac along the margin and near the apex.

This is a close ally of *Dendrobium insigne* Reichb. f., of new Guinea. I have retained it as a species because it is smaller in all its parts than is Reichenbach's species, and especially because the lip lacks the lateral lobes. It is, however, not impossible that it will eventually prove to be merely a variety of the widely distributed *Dendrobium insigne* Reichb. f., which is found at low altitudes in New Guinea and the neighboring islands.

DENDROBIUM PURPUREUM Roxb. Fl. Ind. ed. 2, 3 (1832) 484.

Angraecum purpureum silvestre Rumph. Herb. Amb. 6: 109, *t. 50, f. 1.*

AMBOINA, Wae, *Robinson Pl. Rumph. Amb. 5*, November 29, 1913, a pendant epiphyte, altitude about 20 meters. Flowers lilac, the sepals tipped with green.

DENDROBIUM LANCIFOLIUM A. Rich. Sert. Astrolab. (1834) 20, t. 8.

AMBOINA, Amahoesoe, *Reliquiae Robinsonianae 1637*, September 16, 1913, terrestrial, on hills and along dry water courses, altitude 70 to 150 meters. The tip of the lip and column is pink-lilac, the rest shading from pale lilac to pure white.

ERIA Lindley

ERIA BRACTESCENS Lindl. Bot. Reg. (1841) Misc. 18.

AMBOINA, Wakal, *Reliquiae Robinsonianae 1617*, November 5, 1913, on *Sonneratia* trees along the seashore.

It is not entirely certain that *Eria littoralis* T. & B. is conspecific with E. *bractescens* Lindl., as is generally accepted to be the case.

GRAMMATOPHYLLUM Blume

GRAMMATOPHYLLUM SCRIPTUM (Linn.) Blume Rumphia 4 (1847) 48.

Angraecum scriptum Rumph. Herb. Amb. 6: 95, *t. 42*.

AMBOINA, Paso, *Robinson Pl. Rumph. Amb. 6*, October 29, 1913. Epiphytic, altitude 10 meters; flowers green with purple blotches. Local name *manumpang*.

PHREATIA Lindley

PHREATIA ? POTAMOPHILA Schltr. in Fedde Repert. 10 (1911) 187.

AMBOINA, Roemah tiga, *Reliquiae Robinsonianae 1632*, July 20, 1913. Flowers pale-yellowish; fruit green.

The species is reported by Doctor Robinson as being quite common, but was apparently located just beyond the flowering season, as he found only one plant in flower, and a few with withered inflorescences.

The specimen is apparently the same as *Phreatia potamophila* Schltr., but I did not dissect the single flower, and I have not seen the type specimen of Schlechter's species.

APPENDICULA Blume

APPENDICULA REFLEXA Blume Bijdr. (1825) 301.

AMBOINA, Way tommo, *Reliquiae Robinsonianae 1636*, August 17, 1913, epiphytic, altitude 60 meters; flowers white.

Although Doctor Robinson described the flowers as white, there were no flowers on the specimen examined.

ACRIOPSIS Reinwardt

ACRIOPSIS JAVANICA Reinw. in Flora Lit. 2: 4.

AMBOINA, Hitoe messen, *Reliquiae Robinsonianae 1623*, November 1, 1913, epiphytic, altitude 150 meters. Sepals yellowish, violet along the middle; lip white, lilac in the center.

SARCOCHILUS R. Brown

SARCOCHILUS ZOLLINGERI Reichb. f. in Walp. Ann. 6 (1861) 500.

AMBOINA, Lateri, *Reliquiae Robinsonianae 1633*, August, 25, 1913, epiphytic, altitude 200 meters; flowers yellow.

THRIXSPERMUM Loureiro

THRIXSPERMUM AMPLEXICAULE Reichb. f. Xen. Orch. 2: 121.

AMBOINA, Koesoekoesoe sereh and Batoe merah, *Reliquiae Robinsonianae 1635*, August 23 and 24, 1913, terrestrial, altitude 80 meters; flowers white, with a very pale tinge of violet, at first erect, then spreading, the column with a yellow ring on the inside and a yellow spot below it.

SACCOLABIUM Blume

SACCOLABIUM RUMPHII J. J. Sm. in Bull. Jard. Bot. Buit. 13 (1914) 44.

AMBOINA, Roemah tiga, *Reliquiae Robinsonianae 1634*, July 20, 1913. Epiphytic, usually on *Calophyllum inophyllum* at sea level. Flowers yellow at the base, white toward the apex.

PHALAENOPSIS Blume

PHALAENOPSIS AMABILIS (Linn.) Blume Bijdr. (1825) 295; Tabel *f. 44.*

Angraecum album majus. Rumph. Herb. Amb. 6: 99, *t. 43.*

AMBOINA, Amahoesoe, *Robinson Pl. Rumph. Amb. 8*, August 30, 1913, epiphytic, altitude 4 to 8 meters. Flowers white, callosities on the lip with yellow margins and lilac dots.

PHALAENOPSIS ROBINSONII sp. nov.

Caulis brevis, c. 5-folius, radicibus numerosis. Folia anguste oblique oblonga, obtusa, basin versus sensim angustata, ima basi conduplicata, costa media dorso (sicco), leviter prominente, sicco ad c. 31 cm longa, 5.7 cm lata; vaginae basi tubulosae, ceterum conduplicatae, c. 1.5–2 cm longae. Inflorescentiae foliis breviores, ramosae, pedunculo usque ad rachidem terminalem c. 19.5 cm longo, vaginulis paucis parvis patentibus carinatis donato, rachide diu flores gignente, fractiflexa, c. 3.75 cm vel plus longa, internodiis 0.25–1 cm longis. Bracteae alternatim bifariae, patentes vel patentissimae, conduplicatae, curvatae, concavae, acutae, carinatae, sicco 0.45–0.5 cm longae. Flores intervallis circa terni aperti, mediocres. Sepalum dorsale oblongum, apice marginibus incurvis contiguisque contractum, obtusum, concavum, 7-nervium, carnosum, c. 1.5 cm longum, 0.6 cm latum. Sepala lateralia oblique lanceolata, apice incurvo acuminata, acuta et dorso carinata, concava, 7-nervia, carnosa, c. 1.7 cm longa, 0.55 cm lata. Petala oblique elliptica, obtusa, acute et crasse conico-apiculata, basi satis angusta, concava, 5-nervia, c. 1.4 cm longa, 0.65 cm lata. Labellum porrectum, glabrum basi lamella brevi longitudinali horizontali adpressa antice bidentata dorso obtusangula donatum, appendice longitudinali adnata angusta carnosa lateraliter compressa supra canalicula crenulato-bicostata antice libera horizontali bisubulata usque ad c. 0.6 cm supra basin pertinente ante lamellam basilarem, explanatum c. 1.25 cm longum, ad lobos laterales 0.6 cm latum; lobi laterales breves, erecti, basilares, trianguli, obtusangule falcato-recurvi, fere quadranguli, acuti, extus concavuli, intus medio prope marginem anticum callo brevi verticali erecto rotundato carnoso ornati, c. 0.25 cm longi, basi fere 0.3 cm lati; lobus intermedius porrectus, elliptico-spathulatus, longius unguiculatus, apice contractus, obtusus, costa valida longitudinali carnosa convexa dimidio superiore magis elevata usque in apicem, glaber, carnosus, c. 0.87 cm longus, explanatus 0.375 cm latus. Gynostemium rectum, basi subtus contractum, c. 1 cm longum, apice producto triangulo, obtuso, c. 0.27 cm longo. Anthera magna, cucullata, antice alte obtusangule bilamellata, lateraliter visa oblique quadrangula, c. 0.43 cm longa. Rostellum reversum, bidentatum. Stigma maximum, alte excavatum. Ovarium pedicellatum, 6-sulcatum, c. 1.1 cm longum.

AMBOINA, Hitoe messen, *Reliquiae Robinsonianae 1627*, October 18, 1913, on trees, altitude 600 meters. Flowers white with lilac spots.

A few years ago but one species of *Phalaenopsis* was known from Amboina, the widely distributed *Ph. amabilis* Bl. In 1911 *Ph. amboinensis* J. J. Sm. was described from Amboina and Ceram and in the next year Finet published his *Ph. Hombronii*. One year later the unfortunate and lamented Doctor Robinson discovered two more species, the one above described, and *Ph. Hebe* Reichb. f.

Phalaenopsis amboinensis J. J. Sm., *Ph. Hombronii* Finet, and *Ph. Robinsonii* J. J. Sm. are closely allied species with hairless lips. *Ph. amboinensis* has the largest flowers, which, however, so far as I know, are borne in only 1- or 2-flowered scapes, while in the other two the inflorescences are branched and with more numerous flowers. In *Ph. amboinensis* and *Ph. Hombronii* the midlobe of the lip is provided with a conspicuous longitudinal denticulated keel, which is lacking in *Ph. Robinsonii*.

The three species may be distinguished as follows:

1. Midlobe of lip with a broad, longitudinal, smooth ridge. Sepals oblong. Column foot very short. Inflorescence branched. *Ph. Robinsonii* J. J. Sm.
   Midlobe of lip with a conspicuous denticulated keel. Column foot distinct .... 2.
2. Sepals ovate, 2.5 cm. long, 1.3 cm. and 1.47 cm. broad. Lip 1.9 cm long. Inflorescence unbranched........ *Ph. amboinensis* J. J. Sm.
   Dorsal sepal lanceolate, 1.4 cm long, 0.8 cm broad. Lip 1.8 cm long. Inflorescence branched .... *Ph. Hombronii* Finet.

PHALAENOPSIS HEBE Reichb. f. in Hamb. Gartenz. 18 (1862) 85.

AMBOINA, Koeda mati, *Reliquiae Robinsonianae 1620*, September 3, 1913, epiphytic, altitude 15 meters. Flowers white, turning yellow when old, the base of the sepals with a band of brown dots inside, the lip and column mainly mauve purple, the tip of the lip white. Local name *vanil manumpang*.

The flowers seem to differ a little in color from the Javanese and Sumatran specimens. The Amboina form might perhaps be distinguished as var. **AMBOINENSIS.**

LUISIA Gaudichaud

LUISIA CONFUSA Reichb. f. in Walp. Ann. 6 (1861) 621.

Luisia teretifolia Blume Rumphia 4 (1848) *t. 194, f. 3; t. 197D.*
Angraecum flavum decimum sive angustifolium Rumph. Herb. Amb. 6: 104.

AMBOINA, Paso, *Reliquiae Robinsonianae 1626,* July 20, 1913, epiphytic, altitude 2 meters. Flowers yellowish-green, but the lip, except for the yellow margin, lilac-purple.

I have no doubt that this form is Rumphius's *Angraecum flavum decimum sive angustifolium,* although he states that the leaves are not rounded but flat; I suppose that he intended to say the contrary.

RENANTHERA Loureiro

RENANTHERA MOLUCCANA Blume Rumphia 4 (1848) 54, *t. 193, f. 2; t. 197E.*

Angraecum rubrum Rumph. Herb. Amb. 6: 101, *t. 44, f. 2.*

AMBOINA, Soja, *Robinson Pl. Rumph. Amb. 20,* September 27, 1913. Flowers spotted all over with red, apex of the column white. Native names *bunga karang* and *manumpang karang.*

ROBIQUETIA Gaudichaud

ROBIQUETIA AMBOINENSIS J. J. Sm. in Nat. Tijdschr. Nederl. Ind. 72 (1912) 43.

AMBOINA, Wae, *Reliquiae Robinsonianae 1621,* November 29, 1913, epiphytic, altitude 20 meters. Flowers yellowish.

TAENIOPHYLLUM Blume

TAENIOPHYLLUM MINUTIFLORUM sp. nov.

Caulis abbreviatus, squamis subulatis, radicibus elongatis, angustis, compressis, ad c. 30 cm longis, sicco 0.16 cm latis. Inflorescentiae numerosae, diu florentes, dense multiflorae, pedunculo filiformi, c. 1.2–4 cm longo, vaginulis 2 parvis basi tubulosis carinatis donato, rachide tenui, ad c. 1.35 cm longa, cum bracteis c. 0.125 cm lata, internodiis vix c. 0.03 cm longis. Bracteae alternatim bifariae, patentes, rachidem amplectentes, late triangulae, obtusae, concavae, carinatae, dorso c. 0.05 cm longae. Flores succedanei, parvi, c. 0.16 cm longi. Sepalum dorsale oblongo-ovatum, subobtusum, concavum, 1-nervium, bene 0.1 cm longum. Sepala lateralia oblique lanceolato-triangula, acuta, concava, apice vix incurvula, carinata, 1-nervia, bene 0.1 cm longa. Petala lanceolato-ovata, acuta, concava, 1-nervia, c. 0.1 cm longa. Labellum concavum, subtrilobum, gynostemio duplo longius, explanatum transverse subrhombeum, triangulo-oblongo-contractum, cum calcari cruciforme, totum c. 0.175 cm, absque calcari 0.1 cm longum, 0.1 cm latum; lobi laterales erecti, gynostemio adpressi, semiorbiculari-trianguli, obtusissimi, concavi; lobus intermedius porrectus, oblongus, obtusus, lateraliter compressus, basi tantum concavus, carnosus; calcar reversum, cum ovario angulum acutum faciens, laminam continuum, rectum, oblongum, obtusum, c. 0.075 cm longum. Gynostemium breve, obtusum, c. 0.03 cm longum. Anthera cucullata, in rostrum elongatum oblongum spurie retusum contracta. Rostellum elongatum, infra medium incurvum, antherae parallelum, basi postice triangulo-productum. Ovarium pedicellatum c. 0.1 cm longum. Capsula immatura elongata, 1.3 cm longa, pedicello 0.17 cm longo.

AMBOINA, Hitoe messen, *Reliquiae Robinsonianae 1631*, October 10, 1913, epiphytic, altitude 150 meters. Flowers yellow-green.

This is allied to *Taeniophyllum filiforme* J. J. Sm., but the flowers are smaller and the spur is not inflated.

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NEW PHILIPPINE SHRUBS AND TREES

By E. D. MERRILL[1]

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The present paper consists for the most part of the descriptions of forty-five presumably new species of Philippine trees and shrubs, in the families *Chloranthaceae, Myristicaceae, Saxifragaceae, Cunoniaceae, Leguminosae, Rutaceae, Simarubaceae, Sabiaceae, Sapindaceae, Celastraceae, Elaeocarpaceae, Gonystylaceae, Guttiferae, Combretaceae, Myrtaceae, Symplocaceae, Ericaceae, Ebenaceae, Loganiaceae, Thymelaeaceae,* and *Verbenaceae.* A few changes in nomenclature are included. The genera *Elaeodendron* and *Pleurostylia* are here recorded from the Philippines for the first time, and the new genus *Trifidacanthus* is proposed and described in the *Leguminosae.*

Two characteristic new species of *Xanthostemon* are noteworthy, as are two new species of *Symplocos* with 3-partite calyces, a character hitherto unrecorded for the *Symplocaceae.* The southeastern element in the Philippine flora is emphasized not only by the two additional species of *Xanthostemon,* but by the discovery of a second species of *Ascarina* in the Philippines. The Philippine form of *Pleurostylia* is apparently identical with a New Calendonian variety of *P. wightii* W. & A. The widely distributed *Vaccinium* commonly known as *V. villarii* Vid. is reduced to the Moluccan *V. myrtoides* Miq. The continental element in flora is emphasized by the discovery of *Englehardtia colebrookeana* Lindl. in northern Luzon.

CHLORANTHACEAE

ASCARINA Forster

ASCARINA RETICULATA sp. nov.

Arbor circiter 8 m alta, glabra; foliis oblongo-ellipticis ad oblongo-obovatis, coriaceis, utrinque distincte reticulatis, in siccitate brunneis, usque ad 9 cm longis, obtuse acuminatis, basi acutis, margine crenatis vel serrulato-crenatis; nervis primariis utrinque circiter 15 cum venularum reti utrinque conspicuo; paniculis terminalibus, solitariis, sessilibus vel breviter pedunculatis, 2 ad 2.5 cm longis, bracteis ovatis, subacutis, circiter 2.5 mm longis, deciduis; fructibus ellipsoideis, 3 mm longis, spicatim dispositis.

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A glabrous tree about 8 m high, all parts dark-brown when dry, the branchlets smooth. Leaves oblong-elliptic to oblong-obovate, rather thickly coriaceous, somewhat shining, of the same color on both surfaces, 6 to 9 cm long, 2.5 to 4 cm wide, subequally narrowed to the obtusely acuminate apex and to the acute base, the margins crenate or serrulate-crenate, the basal 1 to 2 mm entire; lateral nerves slender, distinct, about 15 on each side of the midrib, these equally prominent on both surfaces and about as distinct as the secondary nerves and reticulations; petioles 5 to 8 mm long. Panicles terminal, sessile or shortly peduncled, usually branched from the base, 2 to 2.5 cm long, the spike-like branches about 1 cm long; bracts deciduous, ovate, subacute, coriaceous, about 2.5 mm long. Fruits brown, ellipsoid, 3 mm long, numerous, sessile, subtended by a disk-like enlargment of the rachis about 1.5 mm in diameter, tipped by the conspicuous stigma.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26399 Ramos & Edaño*, August 19, 1916, in forests, altitude about 400 meters, locally known as *parukanak*.

A species allied to *Ascarina philippinensis* C. B. Rob., from which it is distinguished by its coriaceous leaves, much more numerous nerves which, with the secondary nerves and reticulations are conspicuous on both surfaces; all parts, stems, branches, leaves, and inflorescences brown when dry; its crenate rather than serrate leaves; and its shorter, deciduous or caducous bracts. The second species of this characteristic Polynesian genus to be found in the Philippines.

JUGLANDACEAE

ENGLEHARDTIA Leschenault

ENGLEHARDTIA COLEBROOKEANA Lindl. in Wall. Pl. As. Rar. 3 (1832) 4, *t. 208*.

LUZON, Ilocos Sur Province, Kirsudan, *For. Bur. 25483 Paraiso*, March 25, 1916, on slopes, altitude about 300 meters, locally known as *pedped*.

The specimen agrees closely with the descriptions and with Indian specimens of this species and I consider it certainly to represent Lindley's species. An older name is perhaps *Englehardtia villosa* (Wall.) Kurz, based in *Juglans villosa* Wall. Cat. (1831, or 1832) no. 4945, but Wallich's name is a *nomen nudum* and has no standing. The species has not previously been reported from the Philippines.

India to Burma and southern China.

MYRISTICACEAE

GYMNACRANTHERA Warburg

GYMNACRANTHERA ACUMINATA sp. nov.

Arbor circiter 11 m alta, inflorescentiis ferrugineo-pubescentibus exceptis glabra; foliis oblongis ad anguste oblongo-ovatis, usque ad 11 cm longis, apice tenuiter subcaudato-acuminatis, basi cuneatis, subcoriaceis, in siccitate brunneis, supra perspicue nitidis, nervis utrinque 5 vel 6, subtus distinctis, curvato-adscendentibus; paniculis axillaribus, multifloris, leviter adpresse ferrugineo-pubescentibus, 3 ad 4 cm longis; floribus ♂ numerosis, 4 mm longis, usque ad medium 3- vel 4-partitis, antheris in massam cylindraceam 1.7 ad 2 mm longam connatis.

A tree about 11 m high, glabrous except the inflorescences. Branches terete, grayish-brown, lenticellate. Leaves subcoriaceous, brown when dry, the upper surface very prominently shining, the lower dull, oblong to narrowly oblong-ovate, 9 to 11 cm long, 3 to 3.5 cm wide, narrowed upward to the prominently caudate-acuminate apex and below to the cuneate base, the acumen slender, about 1.5 cm long, blunt; primary lateral nerves 5 or 6 on each side of the midrib, prominent on the lower surface, curved-ascending, anastomosing, the reticulations very lax, obscure; petioles slender, 1 to 1.4 cm long. Staminate panicles axillary, numerous, 3 to 4 cm long, many-flowered, appressed-pubescent with scattered ferruginous hairs, the flowers racemose-fascicled on the ultimate branchlets. Buds ellipsoid, the mature flowers oblong, 4 mm long, divided to about the middle into 3 or 4, ovate, obtuse lobes, externally sparingly pubescent. Staminal column cylindric, 1.7 to 2 mm long.

SAMAR, Dolores, *For. Bur. 21074 Sherfesee, Cenabre, & Cortes,* April 5, 1914, in forested flats, altitude 15 meters, locally known as *daha-an*

The specimen was originally identified as *Gymnacranthera paniculata* Warb., and while it represents a species allied to the latter, it is readily distinguised among all the Philippine forms by its prominently shining, brown, few-nerved caudate-acuminate leaves. The staminate flowers are rather large for *Gymnacranthera.*

HORSFIELDIA Willdenow

HORSEFIELDIA OBSCURINERVIA sp. nov.

Arbor glabra circiter 11 m alta; foliis oblongis ad oblongo-lanceolatis, coriaceis, usque ad 14 cm longis, utrinque subaequaliter angustatis, acuminatis, basi cuneatis, in siccitate brunneis, nervis utrinque circiter 18, tenuibus, obscuris, haud anastomosantibus, secondariis reticulisque obsoletis; paniculis axillaribus, cir-

citer 6 cm longis, multifloris; floribus ♂ obovoideis, 2 mm longis, 2-lobatis, antheris in massam obovoideam apice depressam 1.5 mm longam connatis.

A glabrous tree about 11 m high, or the very youngest branchlets and the midrib beneath sparingly ferruginous-pubescent. Branches terete, dark-brown, lenticellate. Leaves oblong-lanceolate, 11 to 14 cm long, 3 to 4 cm wide, coriaceous, brown and slightly shining when dry and of nearly the same color on both surfaces, subequally narrowed to the rather prominently acuminate apex, the acumen blunt, and to the cuneate base, the margins recurved; lateral nerves about 18 on each side of the midrib, very slender, obscure, not anastomosing, the secondary ones and reticulations obsolete, the primary nerves very slightly impressed in the median portion on the upper surface, the midrib prominent beneath; petioles 1 to 1.5 cm long. Staminate panicles axillary, about 6 cm long, glabrous, the flowers subracemosely arranged on the short ultimate branchlets. Staminate flowers yellow when fresh, brown when dry, obovoid, 2 mm long, 2-valved, their pedicels 1 to 1.5 mm long. Staminal column obovoid, 1.5 mm long, depressed at the apex.

LUZON, Camarines Province, Paracale, *For. Bur. 26503 de Mesa & Magistrado,* July 26, 1916, on low hills, altitude about 20 meters, locally known as *duguan.*

This rather strongly marked species is well characterized by its relatively narrow, very obscurely nerved leaves. The staminate inflorescences strongly resemble those of *Gymnacranthera paniculata* Warb., but the species is a true *Horsfieldia.*

SAXIFRAGACEAE

DEUTZIA Thunberg

DEUTZIA ACUMINATA sp. nov.

Species *D. pulchrae* Vid. affinis, differt foliis majoribus, usque ad 12 cm longis, nervis utrinque magis numerosis, utrinque circiter 8.

A shrub, all parts more or less white stellate-lepidote. Branches and branchlets terete, reddish-brown, smooth, the latter minutely stellate-lepidote. Leaves lanceolate to oblong-lanceolate, subcoriaceous, brittle, pale-brownish when dry, the lower surface grayish-white or at least paler than the upper surface, 8 to 12 cm long, 3 to 5 cm wide, gradually narrowed upward to the slenderly acuminate apex, the base rounded, margins distantly denticulate, both surfaces with minute, white stellate-lepidote scales, these widely scattered on the upper surface; rather densely arranged on the lower surface; lateral nerves about 8 on each side of the midrib, prominent on the lower surface, curved, anastomosing, the reticulations lax; petioles 1 to 1.5 cm long. Panicles terminal, narrow, up to 8 cm. in length, the lower branches 2 cm long or less, all parts sparingly stellate-lepidote. Fruits cup-shaped, truncate, gray stellate-lepidote, about 5 mm long, 6 mm in diameter, the styles exserted about 5 mm.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26441 Ramos & Edaño,* August 14, 1916, in forests, altitude about 300 meters.

A species manifestly allied to *Deutzia pulchra* Vid., its much larger, more numerously nerved leaves giving it an aspect quite different from the typical form of Vidal's species.

HYDRANGEA Gronovius

HYDRANGEA PUBIRAMEA sp. nov.

Frutex circiter 2 m altus, ramis et inflorescentiis et petiolis et subtus foliis ad costa nervisque pilosis; foliis chartaceis, oblongis ad oblongo-obovatis, acute acuminatis, basi acutis, margine sursum denticulatis, nervis utrinque 5 vel 6, curvato-adscendentibus, subtus in siccitate plus minusve pustulosis; inflorescentiis terminalibus, pedunculatis, ramis primariis radiatis; fructibus junioribus ovoideis, glabris, stylis 3, crassis, curvatis, 2 ad 2.5 mm longis.

A shrub about 2 m high, the young branches, petioles, inflorescences, and leaves on the midrib and lateral nerves beneath pilose with somewhat appressed, pale-brownish hairs. Branches terete, grayish-brown. Leaves chartaceous, oblong to oblong-obovate, grayish-olivaceous when dry, slightly shining, 6 to 11 cm long, 3 to 4 cm wide, apex acutely acuminate, base acute, margins in the upper one-half denticulate, the teeth small, scattered, the lower surface pale-brownish, pustulate when dry; lateral nerves 5 or 6 on each side of the midrib, curved-ascending, anastomosing; petioles 1.5 to 2 cm long. Inflorescences terminal, peduncled, pubescent, the peduncles 5 to 20 mm long, the branches radiate, up to 4 cm long, flower-bearing only toward their apices, the pedicels about 5 mm long. Calyx-tube in fruit cuneate, 2 mm long, the lobes 5, oblong, 1 mm long. Capsule above the calyx-tube ovoid or globose, about 3 mm in diameter; styles 3, rarely 4, stout, curved, 2 to 2.5 mm long.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26521 Ramos & Edaño,* September 8, 1916, in forests, altitude about 300 meters.

A species similar and manifestly allied to *Hydrangea lobbiana* Maxim., from which it is readily distinguished by its indumentum.

Var. **PARVIFOLIA** var. nov.

A typo differt foliis minoribus, 4 ad 6 cm longis, haud pustulatis, petiolis brevioribus.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26511 Ramos & Edaño*, September 6, 1916, in forests, altitude about 240 meters.

This is apparently but a reduced form of *Hydrangea pubiramea*, having smaller leaves and panicles and shorter petioles.

CUNONIACEAE

WEINMANNIA Linnaeus

WEINMANNIA SIMPLICIFOLIA sp. nov.

Frutex circiter 3 m altus, inflorescentiis leviter pubescentibus exceptis glaber; foliis crasse coriaceis, oblongo-ellipticis, usque ad 9 cm longis, in siccitate brunneis, nitidis, utrinque subaequaliter angustatis, apice obtusis, acutis, vel leviter acuminatis, basi plus minusve acuminatis, nervis primariis utrinque circiter 9, venularum reti denso, utrinque conspicuo; racemis numerosis, usque ad 9 cm longis; capsulis anguste ovoideis, circiter 3 mm longis, pubescentibus.

A shrub about 3 m high, glabrous except the inflorescence. Branches terete, brownish, the branchlets smooth, dark-brown, somewhat compressed at the nodes. Leaves simple, opposite, thickly coriaceous, brown and somewhat shining when dry, oblong-elliptic, 4.5 to 9 cm long, 2 to 3.5 cm wide, subequally narrowed to the obtuse, acute, or somewhat acuminate apex, and to the acuminate base, the margins crenate-serrate; primary lateral nerves about 9 on each side of the midrib, these and the prominent, rather close reticulations distinct on both surfaces; petioles 5 to 8 mm long. Inflorescence terminal, simple, or the rachis slightly branched, the peduncles and branches 1 cm long or less, the racemes numerous, fascicled at the tips of the branches or of the peduncle, up to 9 cm long, more or less pubescent with short, brownish hairs. Fruits numerous, fascicled at the nodes of the branches, their pedicels slender, somewhat pubescent, about 2 mm long, the capsules narrowly ovoid, about 3 mm long, brownish-pubescent, tipped by the styles, the latter about 1.5 mm long.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26531 Ramos & Edaño*, September 9, 1916, in forests, altutude about 300 meters.

A characteristic species allied to *Weinmannia luzonensis* Vid., but readily distinguished by its simple, thickly coriaceous, prominently nerved and reticulated leaves.

LEGUMINOSAE

TRIFIDACANTHUS Merrill genus novum

(*Papilionatae-Hedysareae-?Desmodiinae*)

Calycis membranacei, tubus brevis; lobi 2 superiores omnino connati vel apice minute 2-dentatae, 3 inferiores ovato-lanceolati, acuminati. Vexillum late obovatum, basi cuneatum, sessile vel subsessile; alae oblongae, obtusae; carina leviter falcata, obtusa. Stamen vexillare a basi libera, caetera connata; antherae uniformes. Ovarium breviter stipitatum, lineare, circiter 6-ovulatum; stylus leviter incurvus, glaber, stigmate minute terminali. Legumen * * *. Frutex parvus, erectus, subglaber, spinis longis rectis sparsis trifidis armatae. Folia 1-foliolata, foliolis minute stipellatis, ellipticis ad oblongo-ellipticis, integris, breviter petiolatis. Stipulae striatae, siccae, liberae. Flores purpurei, mediocri, racemosi, racemis axillaribus, brevibus, solitariis, paucifloris. Bracteae late ovatae, striatae, parvae; bracteolae 0.

TRIFIDACANTHUS UNIFOLIOLATUS sp. nov.

Frutex erectus, 1 ad 2 m altus, ramis numerosis, rigidis, teretibus; foliis alternis, breviter petiolatis, foliolis ellipticis ad oblongo-ellipticis, utrinque rotundatis, apice minutissime apiculatis, in siccitate pallidis, nitidis, 1.5 ad 3 cm longis; spinis sparsis, rectis, rigidis, tenuibus, trifidis, 8 ad 17 mm longis; racemis axillaribus, solitariis, paucifloris, leviter pubescentibus, circiter 3 cm longis; floribus circiter 1 cm longis.

An erect, much-branched, nearly glabrous shrub 1 to 2 m high, the branches stiff, terete, grayish, rugose when dry, scarcely lenticellate, the wood pale-yellowish, some of the nodes armed with stiff, slender, straight, sharp, trifid spines, their branches 8 to 17 mm long. Leaves numerous, alternate, 1-foliolate, their petioles 2 to 4 mm long, minutely bistipellate at the base of the very short, geniculate petiolule; blades elliptic to oblong-elliptic, equilateral, entire, subcoriaceous, equally rounded at both ends, the apex minutely apiculate, 1.5 to 3 cm long, 7 to 15 mm wide, pale and shining when dry, the lower surface often slightly glaucous, glabrous, or when young minutely puberulent; lateral nerves 6 to 8 on each side of the midrib, slender, anastomosing, not prominent, the reticulations distinct under a lens, rather close; stipules dry, striate, ovate-lanceolate, 1.5 to 2 mm long, acuminate. Racemes axillary, solitary, slender, few-flowered, about 3 cm long, sparingly pubescent, subtended by numerous, somewhat distichous, imbricate bracts similar to

the stipules, the pedicels about 5 mm long, the bracts subtending the pedicels ovate, acuminate, striate, 1.5 mm long. Flowers about 1 cm long, purplish. Calyx sparingly pubescent, membranaceous, 3 mm long, the upper two teeth usually wholly united into a 2-nerved, triangular-ovate, acute to obtuse, 1.2 mm long lobe, sometimes 2-dentate at the tip, the lower three teeth subequal, 1-nerved, ovate-lanceolate, acuminate, about 1 mm long. Petals glabrous, the standard broadly obovate, rounded or somewhat retuse, sessile or with a very short claw, base cuneate, about 9 mm long and 8 mm wide. Wings oblong, slightly inequilateral, free or nearly so, rounded, about 10 mm long and 3.5 mm wide, the claw 1.2 mm long, basal lobe rounded. Keel petals about 8 mm long and 3 mm wide, slightly falcate, oblong-obovate, rounded, the claw as long as that of the wings. Vexillary filament free from the base, the other nine united into a tube, the free parts of the filaments 1 to 1.5 mm long, all fertile, the anthers uniform. Ovary on a 1 mm long stipe, linear, slightly pubescent, about 4 mm long; ovules about 6; style curved, glabrous, about 3 mm long, the stigma minute. Fruit unknown.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci. 27196 Ramos*, March 3, 1917, in dry thickets at low altitudes.

I have placed this proposed new genus in the *Papilionatae-Hedysareae*, and with doubt in the *Desmodiinae*, as the fruits are unknown. It is strongly characterized by its long, straight, trifid, rigid spines and its 1-foliolate, shortly petioled leaves, the leaflet being minutely stipellate and elliptic or oblong-elliptic in shape. It does not appear to be closely allied to any previously described genus either in the group in which it is placed, or in other groups of the *Papilionatae*, although in some respects it is suggestive of the New Caledonian genus *Arthroclianthus* Baill. It is, however, radically different from Baillon's genus in general appearance, vegetative characters, floral characters, and in its trifid spines.

SOPHORA Linnaeus

SOPHORA LONGIPES sp. nov.

Frutex, partibus junioribus minute et parce adpresse pubescentibus; foliis usque ad 17 cm longis, foliolis circiter 15, ovato-ellipticis, in siccitate pallidis, glabris, usque ad 2.5 cm longis, obtusis; racemis axillaribus, foliis subaequantibus; floribus paucis, violaceis, circiter 13 mm longis; fructibus circiter 4 cm longis, longissime stipitatis, cylindraceis vel leviter compressis, haud moniliformibus, apice longe rostratis; seminibus solitariis.

A shrub, the younger branchlets, petioles, and inflorescences minutely pubescent with short appressed hairs; leaves about 17 cm long, somewhat crowded at the apices of the branches; leaflets usually 15, ovate-elliptic, 2 to 2.5 cm long, 1 to 1.4 cm wide, pale when dry, glabrous, chartaceous, base rounded, apex obtuse, the nerves indistinct; petiolules 1 to 2 mm long, slightly pubescent. Racemes axillary, peduncled, about as long as the leaves, rather few-flowered, the pedicels slightly pubescent, about 7 mm long. Flowers violet, 13 mm long. Calyx cup-shaped, 8 mm long, obscurely 2-lipped, the teeth broad, short, the base rounded, inflated on the upper side, subglabrous. Standard 13 mm long, the claw elongated, the limb obovate, truncate-rounded, about 6 mm wide above; keel-petals with claws about 4.5 mm long, their limbs broadly oblong, 7 mm long, 4 mm wide, slightly falcate, apiculate on the outer side, rounded on the inner; wings with claws about 5 mm long, their limbs narrowly oblong, rounded, about 9 mm long, 2 to 2.5 mm wide. Stamens united in the lower 2 mm. Ovary stipitate; ovules about 6. Fruits about 4 cm long, minutely pubescent, the stipe slender, curved, about 2 cm long, the inflated part cylindric or slightly compressed, tipped with a somewhat curved beak less than 1 cm in length; seeds solitary.

LUZON, Batangas Province, on dry slopes between Bauang and Punta de Azufre, *Bur. Sci. 26765 Ramos*, October 20, 1916.

The specimens were from flowering branches taken from old trunks or roots in a deserted clearing, so that the size of the plant is uncertain; it is probably merely a shrub or at most a small tree. It is well characterized by its one-seeded, rostrate-acuminate, long-stipitate pods. It is entirely different from the other two species found in the Philippines.

PTEROCARPUS Linnaeus

PTEROCARPUS PUBESCENS sp. nov.

Arbor alta, omnibus partibus dense molliter pubescentibus, indumento brunneo; foliis circiter 20 cm longis, foliolis usque ad 11, oblongis ad oblongo-ovatis, obtuse acuminatis, usque ad 7 cm longis, nervis utrinque circiter 9, tenuibus; fructibus suborbicularibus, 4 ad 5.5 cm diametro, brunneo-pubescentibus, medio tenuiter spinoso-echinatis, spinis 2 ad 4 mm longis.

A tree variable in size, from 8 to 20 m in height, all parts prominently and densely pubescent with rather soft, brown hairs. Older branches glabrous, reddish-brown, terete, the younger ones densely pubescent. Leaves about 20 cm long, rachis, petioles, and petiolules very densely pubescent, the leaflets more or less pubescent on both surfaces, often densely so; leaflets up to 11, oblong-ovate to oblong, up to 7 cm long, 2.5 to 3.5 cm wide, firmly chartaceous, brownish when dry, somewhat shining, blunt-acuminate, or the acumen sometimes apiculate, base rounded; lateral nerves about 9 on each side of the midrib, slender. Inflorescences reduced to simple, axillary, solitary racemes up to 15 cm in length, the rachis, pedicels, and calyces densely pubescent. Flowers yellow, their pedicels up to 1 cm in length. Calyx about 8 mm long. Standard about 1.4 cm long, the claw stout, 4 mm long, cuneate, the limb 8 to 9 mm wide; wings inequilateral, their claws slender, 4.5 mm long, their limbs oblong, 9 mm long; keel-petals 10 mm long, very inequilateral at the base. Staminal tube split down one side, all filaments united. Ovary densely pubescent. Fruit orbicular or suborbicular, brown, thin, 4 to 5.5 cm in diameter, more or less pubescent, base inequilateral, the central 2.5 cm with numerous, slender, straight, 2 to 4 mm long spines.

LUZON, Bontoc Subprovince, Bauco, *Vanoverbergh 3959* (type), February 1915, altitude about 1,300 meters, locally known as *narra:* Lepanto Subprovince, Cervantes, *Sandkuhl 286*, February 7, 1915.

A species manifestly allied to *Pterocarpus echinatus* Pers. (*P. vidalianus* Rolfe), but at once distinguished by its very dense indumentum, *P. echinatus* Pers. being glabrous.

CYNOMETRA Linnaeus

CYNOMETRA BIFOLIOLATA sp. nov.

Arbor glabra, ramis tenuibus, teretibus, lenticellatis; foliis bifoliolatis, foliolis oblongis ad oblongo-ellipticis, leviter inaequilateralibus, obtusis, basi acutis, subcoriaceis, nitidis, usque ad 10 cm longis, nervis primariis utrinque circiter 10, tenuibus; petiolulis 5 ad 8 mm longis; racemis axillaribus, fasciculatis, confertis, haud 1 cm longis, multifloris, bracteis reniformibus, striatis, circiter 2 mm longis; ovario glabro vel leviter pubescente; staminibus 10.

A glabrous tree attaining a height of about 10 m, the branches slender, terete, lenticellate, grayish when dry, smooth. Leaves bifoliolate, the petioles 5 mm long or less, the petiolules 5 to 8 mm long; leaflets subcoriaceous, oblong to oblong-elliptic, rather pale and shining when dry, 8 to 10 cm long, 3 to 4.5 cm wide, apex obtuse, base acute, slightly inequilateral; primary lateral nerves about 10 on each side of the midrib, slender, anastomosing, scarcely more distinct than are the secondary ones. Flowers white, fragrant, the short racemes crowded in axillary, rather dense, subcapitate inflorescences, the axis of the racemes 4 mm long or less; bracts striate, reniform, about 2 mm long and 4 mm wide, margins pubescent; pedicels about 4 mm long, glabrous. Sepals oblong, obtuse, about 2.3 mm long. Stamens 10; filaments about 4 mm long. Ovary inequilateral, oblong, narrowed upward, glabrous or with very few scattered hairs; style curved, sparingly pubescent, about 3 mm long.

LUZON, Cagayan Province, Gattaran, *For. Bur. 24211 Barros*, August 12, 1915, on river banks, altitude about 30 meters.

A species manifestly allied to *Cynometra ramiflora* Linn., from which it is at once distinguishable by its distinctly elongated petiolules.

RUTACEAE

GLYCOSMIS Correa

GLYCOSMIS PLATYPHYLLA sp. nov.

Frutex circiter 2 m altus, inflorescentiis leviter ferrugineo-pubescentibus exceptis glaber; foliis 2- vel 3-foliolatis, foliolis coriaceis vel subcoriaceis, usque ad 18 cm longis et 9.5 cm latis, breviter late obtuseque acuminatis, basi acutis, nervis primariis utrinque 5 ad 7, subtus perspicuis, laxis, cum costa in siccitate brunneo-rubris; inflorescentiis laxis, pedunculatis, subcorymbosis, usque ad 10 cm longis, floribus 4- vel 5-meris.

A shrub about 2 m high, glabrous except the somewhat ferruginous-pubescent inflorescence. Branches and branchlets terete, brownish or reddish-brown when dry, slender. Leaves 2- or 3-foliolate, the petiole and rachis 2.5 to 5 cm long. Leaflets coriaceous or subcoriaceous, greenish-olivaceous and shining when dry, elliptic to oblong-elliptic, the larger ones up to 18 cm long and 9.5 cm wide, smaller ones on the same branches 7 to 13 cm long, 3.5 to 5 cm wide, broadly and obtusely short-acuminate, base acute, sometimes a little inequilateral; primary lateral nerves 5 to 7 on each side of the midrib, beneath reddish-brown when dry, prominent, curved, arched-anastomosing, the reticulations lax, slender, prominent; petiolules 5 to 8 mm long. Inflorescences in the uppermost axils, subcorymbose, peduncled, appressed-pubescent with short ferruginous hairs, up to 10 cm in length, lax, the flowers greenish-white, crowded on the ultimate branchlets, 4- or 5-merous. Calyx-teeth 4 or 5, rounded, less than 0.5 mm long. Young petals elliptic, rounded, concave, at least 2 mm long, externally very slightly pubescent.

LEYTE, Tigbao, near Tacloban, *Wenzel 1611*, August 23, 1915.

A species manifestly allied to *Glycosmis cochinchinensis* (Lour.) Pierre, and perhaps even referable to it under a very broad interpretation of specific limits. In its very large leaflets; lax prominent nerves which are reddish-brown when dry; and lax, peduncled, elongated inflorescences it appear to be sufficiently distinct to warrant separation from the above polymorphous species.

ARONYCHIA Forster

ACRONYCHIA OBOVATA sp. nov.

Arbor circiter 13 m alta ramulis junioribus et inflorescentiis exceptis glabra; foliis firmiter charactaceis, obovatis ad oblongo-obovatis, usque ad 14 cm longis, apice truncatis, latissime rotundatis vel obscurissime late acuminatis, deorsum angustatis, basi cuneatis, nervis primariis utrinque circiter 12; fructibus globosis, circiter 1 cm diametro, obscure apiculatis, 4-locellatis.

A tree about 13 m high, the very young branchlets and the inflorescences more or less pubescent with pale fulvous hairs, the infructescences ultimately nearly glabrous. Leaves obovate to oblong-obovate, 9 to 14 cm long, 4 to 6 cm wide, the apex truncate, broadly rounded or broadly and obscurely blunt-acuminate, narrowed below the middle to the cuneate base, rather pale when dry, shining; primary lateral nerves about 12 on each side of the midrib, distinct, anastomosing, the secondary nerves and reticulations rather prominent; petioles 2 to 2.5 cm long. Infructescences in the upper axils, peduncled, up to 8 cm in length, sparingly pubescent, ultimately glabrous or nearly so. Fruits globose, somewhat fleshy, broadly and obscurely apiculate, about 1 cm in diameter, brownish when dry, 4-celled, 4-seeded, the seeds about 5 mm long, nearly black, shining.

MINDANAO, Surigao Province, Manangas, Carrascal, *For. Bur. 26473 Mallonga*, December 13, 1916, on slopes in rich soil, altitude about 50 meters.

A species readily recognized by its obovate to obovate-oblong leaves.

SIMARUBACEAE

BRUCEA J. S. Miller

BRUCEA STENOPHYLLA sp. nov.

Frutex 2 ad 3 m altus, partibus junioribus leviter ferrugineo-pubescentibus exceptis glaber; ramis ramulisque teretibus, tenuibus, pallidis; foliis 12 ad 20 cm longis, foliolis 3 ad 5, rariter 7, membranaceis, lanceolatis, usque ad 9 cm longis, 1 ad 2 cm latis, integris vel subintegris, tenuiter acuminatis, basi acutis; infructescentiis foliis subaequantibus, tenuibus; fructibus paucis, oblongo-ovoideis, leviter acuminatis, reticulatis, leviter bicarinatis, circiter 12 mm longis.

A shrub 2 to 3 m high, glabrous except the slightly ferruginous-pubescent younger parts. Branches and branchlets slender, terete, pale. Leaves 12 to 20 cm long, distant; leaflets 3 to 5, rarely 7, opposite, the pairs distant, lanceolate, membranaceous, subolivaceous and shining when dry, entire or very rarely with a few irregular teeth, 6 to 12 cm long, 1 to 2 cm wide, narrowed upward to the slenderly acuminate apex, the base acute; petiolules 5 mm long or less; lateral nerves 7 to 10 on each side of the midrib, slender, anastomosing, not prominent. Infructescences about as long as the leaves, slender, axillary, solitary, the peduncular portion 10 to 15 cm long. Fruits racemosely disposed, few, their pedicels 1 to 1.5 cm long, the fruits oblong-ovoid, about 12 cm long, pale, somewhat bicarinate, about 12 mm long, laxly but prominently reticulate, base rounded, apex somewhat acuminate.

LUZON, Benguet Subprovince, Baguio, *For. Bur. 26396 Oteyza & Garcia* (type), November 11, 1916, *For. Bur. 22903 Leaño*, July 9, 1914, both from thickets along small streams, altitude about 1,500 meters, the type from Forbes Park, Leaño's specimen from the barrio of Lucban.

A species well characterized by its few, very narrow, entire, distant leaflets, and its slender, greatly elongated infructescences. Its alliance is with *Brucea mollis* Wall., and with the Philippine forms described as *B. luzoniensis* Vid. and *B. membranacea* Merr.

SABIACEAE

MELIOSMA Blume

MELIOSMA BRACHYBOTRYS sp. nov.

Species *M. sylvaticae* affinis, differt foliolis majoribus, usque ad 15 cm longis, petiolo rhachibusque glabro, paniculis multo brevioribus, circiter 15 cm longis, glabris vel basi plus minusve ferrugineo-ciliato-pilosis.

A shrub, quite glabrous except the basal parts of the infructescences which are more or less ciliate-pilose with ferruginous, deciduous hairs. Branches brown, terete, the ultimate ones about 7 mm in diameter. Leaves pinnate, about 40 cm long, the petiole and rachis glabrous, pale-brown. Leaflets usually 13, brownish when dry, coriaceous, lanceolate to oblong-lanceolate, 10 to 18 cm long, 3.5 to 5 cm wide, the lower ones often falcate and more or less inequilateral at the base, apex slenderly and sharply subcaudate-acuminate, base acute, margins distantly and minutely apiculate-toothed, especially in the upper part, brownish when dry; lateral nerves 7 or 8 on each side of the midrib, prominent, curved-ascending, anastomosing, the reticulations distinct, lax; petiolules of the lateral leaflets 5 to 14 mm long, of the terminal one up to 2 cm. Panicles terminal, stout, 15 cm long or less, the rachis and short branches thick, brown, glabrous, or the base of the rachis more or less ciliate-pilose, the hairs deciduous, the branches few, 5 cm long or less. Fruits brown or black when dry, obovoid, sessile, 5 to 6 mm long, somewhat rugose, with two distinct longitudinal ridges.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26567 Ramos & Edaño*, August 26, 1916, on forested slopes, altitude about 190 meters.

A species manifestly allied to *Meliosma sylvatica* Elm., from which it is readily distinguished by its larger leaflets; very much shorter panicles; and in being nearly glabrous throughout.

SAPINDACEAE

GUIOA Cavanilles

GUIOA OBTUSA sp. nov.

Frutex, partibus junioribus subtus foliolis et inflorescentiis uniformiter adpresse ferrugineo-pubescentibus; foliis 10 ad 13 cm longis, foliolis plerumque 4, coriaceis, oblongo-ellipticis ad oblongo-obovatis, usque ad 7 cm longis, apice obtusis, basi acuminatis, inaequilateralibus, supra glabris, nitidis, olivaceis vel nigro-brunneis, subtus pallidis, nervis utrinque 8 ad 10, perspicuis; paniculis terminalibus axillaribusque, usque ad 10 cm longis, ferrugineo-pubescentibus; floribus circiter 5 mm diametro.

A shrub about 5 m high, the younger parts, lower surface of the leaflets, and inflorescences uniformly appressed-pubescent with short ferruginous hairs. Branches terete, dark-colored, ultimately glabrous, the branchlets ferruginous-pubescent. Leaves alternate, 10 to 13 cm long, petiole and rachis pubescent; leaflets usually 4, rather thickly coriaceous, oblong-elliptic to oblong-obovate, 5 to 7 cm long, 1.5 to 3 cm wide, the upper pair distinctly larger than the lower one, obtuse, base narrowed, acuminate, inequilateral, the upper surface olivaceous to dark-brown, shining, glabrous, the lower pale, uniformly appressed-pubescent, the midrib, nerves, and reticulations brown in contrast to the pale epidermis; petiolules 3 to 5 mm long, pubescent; lateral nerves 8 to 10 on each side of the midrib, prominent on the lower surface, curved, anastomosing. Panicles axillary and terminal, up to 10 cm long, ferruginous-pubescent. Flowers pinkish-white, about 5 mm in diameter. Outer sepals ovate, obtuse, 2 mm long, the inner ones reniform-orbicular, as long as the outer ones, 3 mm wide. Petals villous, obovate, 3 mm long, base narrowed. Filaments pubescent.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26636 Ramos & Edaño*, September 19, 1916, on forested slopes, altitude about 270 meters.

A species entirely distinct from all previously described Philippine forms, apparently allied to *Guioa villosa* Radlk. of New Caledonia. It is readily distinguished by its ferruginous indumentum and its blunt leaflets.

CELASTRACEAE

ELAEODENDRON Jacquin

ELAEODENDRON MINDANAENSE sp. nov.

Arbor parva, glabra; foliis chartaceis, elliptico-ovatis, integris, usque ad 6 cm longis, basi acutis vel acuminatis, apice latissime breviter obtuse acuminatis, nervis tenuibus, primariis utrinque circiter 8, quam secondariis reticulisque vix magis prominentioribus; cymis axillaribus, brevibus; fructibus junioribus circiter 6 mm longis, obovoideis, petalis 5, orbicularis vel orbiculari-ovatis, rotundatis, circiter 1 mm longis.

A small glabrous tree attaining a height of about 10 m, the branches and branchlets slender, terete, grayish, or the latter somewhat reddish-brown. Leaves opposite, entire, chartaceous, pale-olivaceous, somewhat shining when dry, of the same color on both surfaces, elliptic-ovate or sometimes rhomboid-ovate, 3.5 to 6 cm long, 2.5 to 5.5 cm wide, narrowed to the acute or slightly acuminate base, the apex with a short, broad, blunt acumen; primary lateral nerves about 8 on each side of the midrib, slender, anastomosing, scarcely more prominent than are the secondary ones and the reticulations; petioles slender, 3 to 4 mm long. Cymes axillary, solitary, slender, the peduncles 0.5 to 1 cm long, each usually bearing three fruits, the pedicels 2 to 2.5 mm long, somewhat thickened upward. Corolla-tube funnel-shaped, about 1 mm long, the sepals very broad, short, rounded, somewhat reniform. Petals orbicular to orbicular-ovate, about 1 mm long. Young fruits obovoid, pale when dry, the pericarp rather thin, about 6 mm long.

MINDANAO, Davao District, Mount Badas, *For. Bur. 26243 Ceballos*, September 30, 1916, near the summit of the mountain, altitude about 650 meters.

The first representative of the genus to be found in the Philippines, perhaps most closely allied to *Elaeodendron glaucum* Pers., but with much shorter, greatly reduced cymes and smaller, less prominently nerved, entire leaves.

GLYPTOPETALUM Thwaites

GLYPTOPETALUM RETICULATUM sp. nov.

Frutex 4 ad 5 m altus, glaber, ramis teretibus, ramulis compressis vel indistincte angulatis; foliis coriaceis, in siccitate pallidis, oblongis ad oblongo-ovatis, usque ad 15 cm longis, acuminatis, basi subacutis ad obtusis, brevissime petiolatis, utrinque dense reticulatis, nervis primariis circiter 8, margine minute glanduloso-denticulatis; infructescentiis axillaribus, pedunculаtis, usque ad 7 cm longis, depauperato-cymosis; fructibus globosis, circiter 1 cm diametro.

A glabrous shrub 4 to 5 m high. Branches terete, greenish-olivaceous or brown, the branchlets pale-greenish, somewhat compressed or obscurely angled. Leaves rather thickly coriaceous, oblong-ovate to oblong, 9 to 15 cm long, 3 to 4.5 cm wide, rather pale when dry, slightly shining, both surfaces distinctly and rather densely reticulate, narrowed above to the somewhat acuminate apex, the base subacute to obtuse, margins, somewhat thickened, slightly recurved glandular-denticulate with minute teeth 2 to 5 mm apart; lateral nerves about 8 on each side of the midrib, slender, rather distinct, anastomosing; petioles 2 mm long. Infructescences axillary, peduncled, about 7 cm long, the fruits 1 to 3 on each peduncle in a depauperate cyme. Fruits reddish when fresh, globose, about 10 mm in diameter, smooth, 4-valved, but by abortion with but one or two seeds, the seeds brown when dry, about 8 mm in diameter, the aril large, somewhat fleshy, orange-red.

LUZON, Abra Province, Mount Posuey, *Bur. Sci. 27043 Ramos*, February 4, 1917, on damp forested slopes, altitude about 300 meters.

This species is well characterized by the short-petioled, rather thickly coriaceous leaves, the reticulations dense and evident on both surfaces. It is most closely allied to *Glyptopetalum marivelense* Merr.

GLYPTOPETALUM EUONYMOIDES sp. nov.

Frutex circiter 2 m altus, glaber, ramis ramulisque teretibus; foliis subcoriaceis, late ellipticis ad obovatis, usque ad 5 cm longis, apice late rotundatis, basi acutis, margine integris vel sursum obscure crenatis, in siccitate pallidis vel subolivaceis, interdum glaucescentibus, nervis primariis utrinque 4 vel 5, tenuibus, obscuris; cymis axillaribus, dichotomis, paucifloris, 4 ad 6 cm longis; floribus 4-meris, circiter 7.5 mm diametro; petalis orbiculari-reniformibus, circiter 3 mm longis; fructibus junioribus ovoideis, circiter 8 mm longis, loculicide 4-valvis, seminibus solitariis.

A glabrous shrub about 2 m high, the branches and branchlets terete, the former brown, the latter pale-greenish and 1 to 1.5 mm in diameter. Leaves subcoriaceous, broadly elliptic to obovate, 4 to 5 cm long, 2.5 to 4 cm wide, apex broadly rounded, base acute, smooth, slightly shining, entire or the margins above obscurely and distantly crenate, when dry pale to subolivaceous, sometimes more or less glaucous; lateral nerves 4 or 5 on each side of the midrib, obscure, slender, obscurely anastomosing, the reticulations very lax; petioles 4 to 5 mm long. Cymes axillary, peduncled, dichotomous, few-flowered, 4 to 6 cm long. Flowers 4-merous, 7 to 8 mm in diameter, their pedicels 1 to 2 mm long, the bracteoles 1 mm long or less. Sepals orbicular, rounded, about 1 mm long. Petals orbicular-reniform, entire, more or less recurved, about 3 mm long and 4 mm wide. Ovules 1 in each cell. Fruit, slightly immature, ovoid, about 8 mm long, 4-valved, by abortion 1-celled, 1-seeded, the seed broadly ellipsoid, 6 to 7 mm long, the aril less than one-half as long as the seed.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci. 27546 Ramos*, February 20, 1917, on slopes in thickets at low altitudes.

In vegetative characters this species somewhat resembles a small-leaved form of *Euonymus viburnifolius* Merr. It is well characterized by its broadly elliptic to obovate leaves which are often glaucous when dry. It is not closely allied to any other known form of the genus.

GLYPTOPETALUM GLANDULOSUM sp. nov.

Frutex glaber 3 ad 4 m altus, ramis teretibus, purpureo-brunneis, ramulis concoloribus, tenuibus, sulcatis vel 4-angulatis; foliis subtus prominente brunneo-glandulosis, chartaceis vel subcoriaceis, oblongis, usque ad 7 cm longis, obtuse acuminatis, basi acutis, margine distanter crenulato-denticulatis, nervis utrinque 4 vel 5, tenuibus, perspicuis, anastomosantibus; inflorescentiis axillaribus, cymosis vel subumbellatis, paucifloris, usque ad 1.5 cm longis vel interdum floribus solitariis; floribus tenuiter pedicellatis, 4-meris, 4 ad 5 mm diametro, petalis obovatis.

A glabrous erect shrub 3 to 4 m high. Branches brownish-purple, terete, smooth, the branchlets of the same color, slender, sulcate or 4-angled, the ultimate ones about 1 mm in diameter. Leaves oblong, chartaceous to subcoriaceous, 5 to 7 cm long, 1.6 to 3 cm wide, subolivaceous, slightly shining and of about the same color on both surfaces when dry, narrowed above to the blunt-acuminate apex, the base acute, margins distantly crenate-denticulate, the lower surface with numerous, rather prominent, dark-brown glands; lateral nerves 4 or 5 on each side of the midrib, slender, distinct, arched-anastomosing, the reticulations very lax; petioles 5 to 7 mm long. Inflorescences cymose or subumbellate, few-flowered, axillary, 1.5 cm long or less, sometimes the flowers solitary. Flowers pale straw-color, 4-merous, 4 to 5 mm in diameter, their pedicels slender, 5 to 6 mm long. Outer two sepals reniform, rounded, about 1 mm long and 1.5 mm wide, the inner two distinctly larger. Petals obovate, rounded, 2 mm long, entire. Anthers subsessile on the disk. Ovary 4-celled; cells 1-ovuled.

PALAWAN, Mount Capoas, *Merrill 9547*, April 21, 1913, on steep talus slopes, lower limits of the mossy forests, altitude about 900 meters.

A very characteristic species readily recognizable by its prominently glandular leaves.

GLYPTOPETALUM REMOTINERVIUM sp. nov.

Frutex glaber 3 ad 5 m altus, ramis ramulisque teretibus; foliis olivaceis, oblongo-ovatis ad oblongis, chartaceis, usque ad 17 cm longis, acutis vel brevissime acuminatis, basi acutis, margine obscure crenulatis, nervis utrinque circiter 6, distantibus, supra impressis, subtus perspicuis, arcuato-anastomosantibus; cymis axillaribus, depauperatis, pedunculatis, 3 ad 4 cm longis; fructibus circiter 8 mm diametro.

A glabrous shrub 3 to 5 m high, the branches and branchlets smooth, olivaceous, terete, the latter 1.5 to 2 mm in diameter. Leaves oblong-ovate to oblong, firmly chartaceous, olivaceous, of the same color and slightly shining on both surfaces when dry, 15 to 17 cm long, 5.5 to 6.5 cm wide, narrowed above to the acute or slightly acuminate apex, base acute, margins usually somewhat recurved and obscurely and distantly crenulate; lateral nerves about 6 on each side of the midrib, distant, impressed on the upper surface, very prominent on the lower surface, arched-anastomosing about 1 cm from the edge of the leaf, the reticulations very lax, obscure; petioles 6 to 8 mm long. Cymes in the upper axils, depauperate, peduncled, 3 to 4 cm long. Fruits subglobose, about 8 mm in diameter, the pericarp white or pink, the seeds red, brown when dry, ovoid, about 6 mm long.

PALAWAN, Ewiig River, *Merrill 741*, February 15, 1903 (type), in forests, altitude about 300 meters. I am convinced that *Elmer 13095*, distributed as *Euonymus alatus* Elm. belongs here, although of it I have seen only leaf specimens. It is from the same general locality as *Merrill 741*, and has nothing to do with *Euonymus alatus* Elm. which is a true *Euonymus* that I have below renamed *Euonymus elmeri* Merr.

The species is well characterized by its relatively large, remotely and prominently nerved leaves, in its distinct nerves somewhat resembling *Glyptopetalum euphlebium* Merr., differing from that species in its much fewer nerves, larger leaves, and smaller fruits.

GLYPTOPETALUM EUPHLEBIUM (Merr.) comb. nov.

Glyptopetalum marivelense Merr. var. *euphlebium* Merr. in Philip. Journ. Sci. 10 (1915) Bot. 322.

The form that I characterized as a variety of *Glyptopetalum marivelense* Merr. I now consider to be specifically distinct. It differs from *Glyptopetalum marivelense* Merr. in its somewhat longer, relatively narrower leaves, which are up to 15 cm in length and 2.5 to 4 cm wide, and especially in its more numerous lateral nerves which are impressed on the upper surface, very prominent beneath and arched-anastomosing; there are 10 to 12 pairs of lateral nerves, while in *G. marivelense* Merr. there are but 6 or 7 pairs which are not impressed on the upper surface and not very prominent on the lower surface.

LUZON, Zambales Province, Mount Tapulao, *For. Bur. 8108 Curran & Merritt*, December 15, 1907, in forests, altitude 100 to 1400 meters.

EUONYMUS Linnaeus

EUONYMUS ELMERI nom. nov.

Euonymus alatus Elm. Leafl. Philip. Bot. 4 (1912) 1484, non Regel.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci. 25436 Yates*, December, 1916.

This species was originally described from specimens collected on Sibuyan Island, and is known only from the original collections, *Elmer 12256, 12485*, and the specimen cited above. *Elmer 13095* from Palawan, distributed as *E. alatus* Elm., of which I have seen only leaf specimens, is *Glyptopetalum remotinovium* Merr.

PLEUROSTYLIA Wight

PLEUROSTYLIA WIGHTII W. & A. Prodr. (1834) 157, var. **NEOCALEDONICA** Loesen.

LUZON, Batangas Province, Mount Batulao, *Bur. Sci. 22350 Ramos*, July 27, 1914, on dry hills.

The specimen is an exact match for New Caledonian material, *Balansa 570, Hennecart s. n.*, representing the variety named by Loesener; I have not seen the description of this variety. Both the New Caledonian material and the Luzon specimen are distinctly different from typical Ceylon material of *Pleurostylia wightii* W. & A. The genus is new to the Philippines.

VITACEAE

LEEA Linnaeus

LEEA ACUMINATISSIMA sp. nov.

Species *L. unifoliolatae* Merr. affinis, differt foliis minoribus, coriaceis, grosse crenato-serratis, basi rotundatis cordatisque.

A shrub about 1 m high, entirely glabrous, the branches terete, brown, about 5 mm in diameter. Leaves simple, lanceolate to oblong-lanceolate, coriaceous, mostly 10 to 17 cm long, 3 to 5 cm wide, sometimes up to 22 cm long and 7 cm wide, brownish-olivaceous, apex caudate-acuminate, acumen slender, up to 2 cm long, base rounded, distinctly cordate, margins coarsely crenate-serrate, the upper surface brownish-olivaceous when dry, the lower surface paler; lateral nerves about 12 on each side of the midrib, prominent, anastomosing, the reticulations subparallel, distinct; petioles about 2 cm long, channeled, with narrow deciduous marginal wings. Infructescences terminal, very short, 2 cm long or less, the immature fruits green, black when dry, globose, 5 to 7 mm in diameter.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26260 Ramos & Edaño*, August 14, 1916, on forested slopes, altitude about 350 meters, locally known as *paratalak*.

A very characteristic species closely allied to *Leea unifoliolata* Merr., from which it is readily distinguishable by its smaller, coriaceous, caudate-acuminate, coarsely toothed, fewer-nerved leaves, which are rounded and distinctly cordate at the base.

ELAEOCARPACEAE

ELAEOCARPUS Linnaeus

ELAEOCARPUS FORBESII sp. nov. § *Dicera*.

Arbor circiter 10 m alta partibus junioribus et inflorescentiis exceptis glabra; foliis coriaceis, ellipticis, usque ad 13 cm longis, basi rotundatis vel obtusis, apice obtuse acuminatis, margine distanter crenatis, nervis utrinque 7 ad 9, subtus cum reticulis primariis perspicuis; petiolo 1.2 ad 3 cm longo; racemis axillaribus, solitariis, 2 ad 4 cm longis, adpresse pubescentibus; floribus 5-meris, confertis, circiter 9 mm longis, sepalis petalisque extus uniformiter adpresse pubescentibus, petalis oblongo-obovatis, 8 mm longis, laciniatis, laciniae circiter 15, usque ad 3 mm longae; staminibus circiter 14, antheris anguste oblongis, obtusis, circiter 2.7 mm longis, appendiculatis; ovario 3-loculare.

A tree about 10 m high, quite glabrous except the younger parts and the inflorescence. Branches terete, rugose when dry, dark-brown, the branchlets obscurely pubescent, the indumentum dark-brown, appressed. Leaves coriaceous, elliptic, rather pale when dry, 9 to 13 cm long, 3.5 to 6.5 cm wide, base rounded or obtuse, apex shortly and obtusely acuminate, sometimes apiculate, margins distantly crenate; lateral nerves 7 to 9 on each side of the midrib, very prominent on the lower surface, curved, anastomosing, the primary reticulations very prominent, lax, the ultimate ones very distinct; petioles 1.2 to 3 cm long. Racemes in the upper axils, solitary, 2 to 4 cm long, rather densely flowered, all parts rather densely pubescent with pale brownish or grayish, appressed, shining hairs. Flowers whitish, 5-merous, about 9 mm long, their pedicels pubescent, about 4 mm long. Sepals lanceolate, externally densely appressed-pubescent, about 7 mm long, 2.2 mm wide below, gradually narrowed upward, somewhat acuminate. Petals narrowly oblong-obovate, about 8 mm long, externally densely appressed-pubescent with pale, shining hairs, internally appressed-villous especially in the median part and along the margins, the base obtuse, the apex divided in the upper 3 mm into about 14, irregular, slender, laciniae. Stamens about 14; filaments 2 to 2.5 mm long; anthers slightly longer then the filaments, narrowly oblong, up to 2.8 mm in length, one cell obtuse, the other slightly longer, acute, not at all bearded or awned. Ovary ovoid, pubescent, 3-celled; style glabrous, 6 mm long.

LUZON, Benguet Subprovince, Baguio, Forbes Park, *For. Bur. 24726 Leaño* (type), September 27, 1915, *Sandkuhl 342*, July 28, 1915, from the same tree.

This tree grows along streams in the pine region at an approximate altitude of 1,300 meters. It seems to be most closely allied to *Elaeocarpus burebidensis* Elm., of Mindanao, from which it is easily distinguished by its differently shaped, much longer-petioled leaves. This characteristic species is dedicated to the Honorable W. Cameron Forbes, ex-Governor of the Philippines, in whose honor Forbes Park at Baguio was named.

GONYSTYLACEAE

GONYSTYLUS Teysmann and Binndendyck

GONYSTYLUS OBOVATUS sp. nov.

Arbor circiter 20 m alta, inflorescentiis exceptis glabra; foliis subcoriaceis, obovatis, usque ad 9 cm longis, apice rotundatis, leviter obtuse acuminatis vel retusis, basi late acutis, supra minutissime puncticulatis, subtus eglandulosis, nervis primariis utrinque circiter 20, quam secondariis haud magis distinctioribus; inflorescentiis terminalibus, solitariis, 4 ad 9 cm longis; fructibus junioribus longe pedunculatis, ellipsoideis, circiter 2.5 cm longis.

A tree about 20 m high, glabrous except the inflorescence. Branches reddish-brown, terete, rugose when dry. Leaves subcoriaceous, obovate, 6 to 9 cm long, 4 to 7 cm wide, rather pale when dry, shining, the apex broadly rounded, sometimes retuse, or even slightly acuminate, the base broadly acute; lateral primary nerves about 20 on each side of the midrib, evident on both surfaces but scarcely more distinct than are the secondary ones and the reticulations; petioles reddish-brown, 1.5 to 2 cm long. The upper surface minutely puncticulate, the lower eglandular. Inflorescences terminal and in the upper axils, solitary, apparently racemose, nearly glabrous at maturity. Flowers unknown. Fruits brown when dry, rugose, ellipsoid, about 2.5 cm long, the stout peduncles 2 to 2.5 cm long. Persistent calyx-lobes ovate, coriaceous, glabrous externally, inside densely hirsute.

BABUYAN ISLANDS, Calayan, *For. Bur. 26713 Peñas*, May 19, 1917, in forests, altitude about 30 meters.

The alliance of this species is with *Gonystylus philippinensis* Elm., of Sibuyan Island, from which it differs in its differently shaped leaves which are eglandular beneath. Its extra-Philippine alliance is with *Gonystylus bancanus* Baill., which is represented by numerous Philippine collections. To this genus pertains the species described by Elmer as *Thea reticulata* Elm. Leafl. Philip. Bot. 8 (1915) 2838 (*Elmer 13478*, Agusan Subprovince, Mindanao), which should be called **GONYSTYLUS RETICULATUS** (Elm.); it is apparently closely allied to the Bornean *Gonystylus affinis* Radlk.

GUTTIFERAE

GARCINIA Linnaeus

GARCINIA MULTIBRACTEOLATA sp. nov. § *Xanthochymus*.

Arbor glabra, circiter 15 m alta, ramis teretibus, ramulis teretibus vel obscure angulatis; foliis coriaceis, olivaceis, nitidis, oblongo-ellipticis, usque ad 15 cm longis, apice obtusis, acutis, vel obscurissime acuminatis, basi decurrento-acuminatis, nervis primariis utrinque circiter 16, tenuibus; inflorescentiis ♂ terminalibus, fasiculatis, ramulis elongatis, 1 ad 2 cm longis, bracteolis numerosis imbricatis quadrifariis instructis; floribus solitariis, terminalibus, 5-meris, sepalis petalisque similibus, sepalis circiter 5 mm longis; phalangibus 5, utrinque polyandris; corpus centrale fungiforme, pedicellatum.

A glabrous tree, about 5 mm high, the branches terete, olivaceous, somewhat wrinkled when dry, the branchlets more or less angular. Leaves coriaceous, olivaceous, shining, of the same color on both surfaces, oblong-elliptic, base somewhat decurrent-acuminate, apex obtuse, acute, or slightly acuminate, margins somewhat cartilaginous-thickened, usually more or less revolute; primary lateral nerves about 16 on each side of the midrib, somewhat spreading, rather slender, anastomosing, the secondary ones and primary reticulations nearly as prominent; petioles stout, 6 to 10 mm long. Inflorescence terminal, each consisting of from 5 to 8, stout, 1 to 2 cm long, 1-flowered, fascicled rachises, the rachises supplied with very numerous, crowded, imbricate, triangular-acute bracteoles about 2 mm long and 3 mm wide, arranged in four series, making the rachis more or less 4-angled. Male flowers 5-merous, solitary, sessile, terminal, pinkish-white. Sepals 5, coriaceous, elliptic, concave, about 5 mm long. Petals similar to the sepals but, in bud, somewhat smaller. Phalanges 5, free nearly to the base, densely covered on all surfaces with very numerous, minute anthers. Rudimentary ovary fungiform, the disk-like stigma about 1.4 mm in diameter, peduncled.

MINDANAO, Surigao Province, Placer, *Wenzel 1806*, June 20, 1916, in forests, altitude about 150 meters.

The alliance of this species is manifestly with *Garcinia moselleyana* Pierre, from which it is readily distinguished by its remarkable, elongated, fascicled, stout, quadrifarously multibreaceolate rachises or partial inflorescences.

GARCINIA HETEROPHYLLA sp. nov.

Arbor parva, glabra, ramulis teretibus; foliis sessilibus vel brevissime petiolatis, lanceolatis ad ovatis, acuminatis, basi rotundatis ad perspicue cordatis, usque ad 10 cm longis, coriaceis, nervis utrinque 7 ad 9, tenuibus, anastomosantibus, reticulis laxis; fructibus axillaribus, solitariis, subsessilibus, globosis, carnosis, circiter 3 cm diametro.

A small glabrous tree, the branches and branchlets brown, terete. Leaves coriaceous, brown when dry, slightly shining, lanceolate to ovate, 6 to 10 cm long, 2 to 5 cm wide, the lanceolate ones usually rounded at the base, the ovate ones prominently cordate, sessile or very shortly petioled, apex prominently blunt-acuminate; lateral nerves 7 to 9, slender, anastomosing, the reticulations lax. Fruits axillary, solitary, globose, fleshy, sessile or subsessile, about 3 cm in diameter, dark-brown when dry, the pericarp thin; each with about three seeds.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26457 Ramos & Edaño*, August 13, 1916, in forests, altitude about 300 meters.

A very characteristic species, allied to *Garcinia cordata* Merr., from which it is at once distinguished by its few-nerved leaves. The sessile or subsessile, lanceolate to ovate leaves are very characteristic, the former usually rounded at the base, the latter deeply cordate, the lobes partly surrounding the branchlets.

KAYEA Wallich

KAYEA MEGALOCARPA sp. nov.

Frutex vel arbor parva, glabra, ramis et ramulis teretibus; foliis coriaceis, laevis, nitidis, oblongis ad oblongo-lanceolatis, usque ad 25 cm longis, obtuse acuminatis, basi rotundatis, nervis primariis utrinque circiter 20, tenuibus; petiolo crasso, 6 ad 8 mm longo; fructibus terminalibus, solitariis, pedunculatis, in siccitate brunneis, furfuraceis, globosis vel ovoideis, circiter 4 cm diametro.

A shrub or small tree, entirely glabrous, the branches and branchlets terete, the former brown or greenish-olivaceous, the latter reddish-brown. Leaves oblong to oblong-lanceolate, coriaceous, smooth, shining, of about the same color on both surfaces, rather pale when dry, 20 to 25 cm long, 4 to 7 cm wide, base rounded, apex obtusely acuminate; lateral nerves about 20 on each side of the midrib, slender, anastomosing; petioles reddish-brown, 6 to 8 m long. Fruit globose or ovoid, about 4 cm in diameter, brown when dry, externally furfuraceous, terminal, solitary, the peduncle about 2 cm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26360 Ramos & Edaño*, August 17, 1916, in forests at low altitudes.

A characteristic species allied to *Kayea navesii* Vesque, from which it differs by its leaves rounded at the base, its much longer petioles, and its much larger fruits.

VIOLACEAE

RINOREA Aublet

RINOREA GLANDULOSA (Elm.) comb. nov.

Gelonium glandulosum Elm. Leafl. Philip. Bot. 3 (1910) 917.
Rinorea fasciculata var. *minor* Elm. Leafl. Philip. Bot. 8 (1915) 2877.

The type of *Gelonium glandulosum* Elm. is *Elmer 12315* from Sibuyan; the type of *Rinorea fasciculata* var. *minor* is *Elmer 12724* from Palawan. Regarding the former Pax & Hoffmann[2] state: "certissime non ad genus pertinet", and an examination of the specimen shows it to be a *Rinorea*, from which I do not believe that *Rinorea fasciculata* var. *minor* Elm. can be distinguished. The species is distinguished from *Rinorea fasciculata* (Turcz.) Merr. by a number of characters, notably its smaller, fewer-nerved leaves. The same species is represented by *For. Bur. 24769 Vergara* from Panay, with the Visayan name *calumpingan.*

RINOREA FASCICULATA (Turcz.) comb. nov.

Pentaloba fasciculata Turcz. in Bull. Soc. Nat. Mosc. 27 (1854) 341.
Alsodeia fasciculata F.-Vill. Novis. App. (1880) 12.

This species is now represented by a number of collections from various parts of the Philippines. The type is *Cuming 1074*, not localized, but probably from Zambales Province, Luzon.

RINOREA FORMICARIA (Elm.) comb. nov.

Alsodeia formicaria Elm. Leafl. Philip. Bot. 5 (1913) 1850.

The type of this species is *Elmer 12886* from Palawan. I have already noted elsewhere[3] that *Alsodeia dubia* Elm. is no violaceous plant but pertains to the *Euphorbiaceae* and is *Trigonopleura dubia* (Elm.) Merr. (*T. philippinensis* Merr.). *Rinorea pulgarensis* Elm. Leafl. Philip. Bot. 5 (1913) 1849 is likewise no violaceous plant but pertains to the *Ebenaceae* and is **DIOSPYROS PULGARENSIS** (Elm.) Merr., a species apparently allied to *Diospyros fasciculiflora* Merr.

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[2] Engl. Pflanzenreich 63 (1914) 414.

[3] Philip. Journ. Sci. 11 (1916) Bot. 77.

COMBRETACEAE

TERMINALIA Linnaeus

TERMINALIA CRASSIRAMEA sp. nov.

Arbor 5 ad 15 m alta, ramulis junioribus incrassatis, 1 ad 2 cm diametro, cicatricibus multis prominentibus ornatis, plus minusve rufo-villosis; foliis confertis, brevissime petiolatis, oblongo-obovatis, firmiter chartaceis, usque ad 35 cm longis, apice rotundatis plerumque abrupte breviterque apiculato-acuminatis, deorsum angustatis, basi circiter 2 cm latis, leviter cordatis, nervis utrinque 25 ad 35, subtus perspicuis, anastomosantibus cum costa reticulisque prominentibus plus minusve rufo- vel ferrugineo-pubescentibus; fructibus junioribus ellipsoideis, cylindraceis, circiter 3.5 cm longis, breviter apiculatis, laevis, glabris.

A tree 5 to 15 m high, more or less ferruginous- or rufous-pubescent, the branches smooth, glabrous, stout, the upper 3 to 10 cm of the ultimate branchlets much thickened, cylindric, 1 to 2 cm in diameter, strongly marked with the numerous large scars of fallen petioles, the leaves crowded at the apices of the branchlets. Leaves oblong-obovate, firmly chartaceous to subcoriaceous, 23 to 35 cm long, 7 to 16 cm wide, olivaceous or greenish-olivaceous when dry, the upper surface glabrous, shining, the lower somewhat paler, more or less ferruginous- or rufous-pubescent on the midrib, nerves, and reticulations, the apex rounded, usually shortly and abruptly apiculate, gradually narrowed in the lower one-half to two-thirds, the base about 3 cm wide, somewhat cordate; lateral nerves very prominent, 25 to 35 on each side of the midrib, anastomosing, the reticulations subparallel, prominent; petioles stout, 5 mm long or less, pubescent to glabrous. Infructescences axillary, up to 14 cm in length, the immature fruits ellipsoid, olivaceous, cylindric, not at all compressed, about 3.5 cm long, 2.5 cm in diameter, glabrous, shining, slightly apiculate.

LEYTE, near Ormoc, *For. Bur. 12764 Rosenbluth* (type), March 13, 1909, in valleys, second-growth forests, and open country, altitude about 40 meters, locally known as *lanipao; For. Bur. 11583 Whitford,* March 16, 1909, sterile. The same species occurs in Agusan Subprovince, Mindanao, represented in the herbarium by three sterile specimens, *For. Bur. 7568 Hutchinson, For. Bur. 24400 Cortez & Fernandez, For. Bur. 24460 Miras, Mariano, & Valderrama,* all bearing the Visayan name *lanipao,* and one the Manobo name *yanipao.*

This most characteristic species is readily distinguishable by its much thickened, prominently scarred branchlets, its crowded, large, short-petioled, many-nerved leaves, which are gradually narrowed below to the slightly cordate base, and its ellipsoid smooth fruits that are not at all compressed. It is not closely allied to any previously described Philippine form.

MYRTACEAE

TRISTANIA R. Brown

√**TRISTANIA MICRANTHA** sp. nov.

Arbor 20 m alta (fide Oro), inflorescentiis distincte cinereo-pubescentibus exceptis glabra; foliis oblongo-ellipticis, usque ad 13 cm longis, obtusis vel latissime obtuse acuminatis, nitidis, basi acuminatis, nervis utrinque 20 ad 30, tenuibus, subtus distinctis, anastomosantibus, in pagina inferiore minutissime puncticulatis; inflorescentiis axillaribus terminalibusque, pedunculatis, laxis, usque ad 10 cm longis, partibus junioribus distincte cinereo-pubescentibus; floribus circiter 2 mm longis, 5-meris, calycibus extus cinereo-puberulis, petalis suborbicularibus, 1.2 mm diametro, integris, glabris; staminibus 15, filamentis brevissimis; ovario pubescente, 3-loculare.

A tree about 20 m high (fide Oro), glabrous except the distinctly cinereous-pubescent inflorescences. Branches terete, pale brownish, the branchlets terete, smooth, reddish-brown. Leaves alternate, in general oblong-elliptic, 7.5 to 13 cm long, 3 to 4.5 cm wide, shining when dry, the upper surface brownish-olivaceous, the lower paler and very minutely glandular-puncticulate, apex obtuse to very broadly blunt-acuminate, base acuminate, margins slightly recurved; lateral nerves slender but distinct, 20 to 30 on each side of the midrib, anastomosing with the distinct marginal nerves about 2 mm from the edge of the leaf; petioles about 1 cm long. Cymes axillary and terminal, lax, 5 to 10 cm long, peduncled, dichotomously branched, the peduncles reddish-brown, nearly glabrous, the younger parts rather densely cinereous-pubescent. Flowers about 2 mm long, 5-merous, their pedicels pubescent, 1.5 to 2.5 mm long. Calyx turbinate, cinerous-pubescent, about 2 mm long, the teeth 5, short, rounded. Petals glabrous, suborbicular, rounded, entire, 1.2 mm in diameter. Stamens 15, in five groups of three each, the filaments glabrous, less than 0.5 mm long. Ovary pubescent, 3-celled.

SAMAR, near Catbalogan, *For. Bur. 22877 Oro*, August 18, 1914, on steep slopes, altitude about 400 meters, locally known as *tiga busag*.

The alliance of this species is manifestly with *Tristania decorticata* Merr. which it closely resembles in many characters. It differs in its larger leaves; much longer inflorescences which in their younger parts are rather densely cinereous-pubescent; smaller flowers; and much shorter stamens.

XANTHOSTEMON F. Mueller

XANTHOSTEMON PHILIPPINENSIS sp. nov.

Arbor circiter 20 m alta, partibus junioribus leviter ferrugineo-pubescentibus exceptis glabra; foliis ellipticis ad obovato-ellipticis, coriaceis, usque ad 7 cm longis, in siccitate pallidis, subtus puncticulatis, apice rotundatis, basi decurrento-acuminatis; floribus flavis, cum staminibus circiter 2.5 cm longis, in axillis superioribus vel inflorescentiis racemosis efformantibus.

A tree about 20 m high, glabrous except the more or less ferruginous-pubescent young branchlets. Branches terete, reddish-brown. Leaves alternate, crowded toward the ends of the branchlets, elliptic to obovate-elliptic, coriaceous, pale and somewhat shining when dry, 4 to 7 cm long, 2.5 to 3.5 cm wide, apex rounded, base decurrent-acuminate, the lower surface glandular-punctate; lateral nerves about 10 on each side of the midrib, slender; petioles up to 1 cm in length. Flowers in the uppermost axils and forming terminal racemes, yellow, their pedicels about 1 cm long. Calyx-tube cup-shaped, about 5 mm long and 8 mm in diameter, the lobes 5, reniform, about 2 mm long and 4 to 5 mm wide, their margins minutely ciliate. Petals 5, suborbicular, rounded, 7 to 8 mm in diameter. Disk very prominent, lining the perianth-tube, about 8 mm in diameter, distinctly projecting beyond the insertion of the filaments. Stamens about 24, their filaments about 15 mm long. Ovary superior, ovoid, 3-celled; style 2 cm long.

LUZON, Camarines Province, Paracale, *For. Bur. 24812 de Mesa*, November 30, 1915, altitude about 40 meters, locally known as *canacanala*.

A very characteristic species, at once distinguished from *Xanthostemon verdugonianus* Naves by its larger yellow flowers and its prominent disk. In vegetative characters the two species are very similar.

√**XANTHOSTEMON BRACTEATUS** sp. nov.

Arbor glabra; foliis coriaceis, oblongo-obovatis, usque ad 18 cm longis, apice obtusis ad obtuse acuminatis, deorsum angustatis, basi cuneatis, in siccitate supra pallidis vel flavicantibus, subtus saepe cupreis, puncticulatis, nervis utrinque circiter 12; inflorescentiis axillaribus, circiter 12 cm longis, paucifloris, bracteis multis lanceolatis foliaceis instructis; floribus albidis, circiter 3.5 cm diametro, 5-meris, petalis orbiculari-obovatis, sepalis ovato-lanceolatis, acuminatis, staminibus circiter 25; capsulis 1 cm diametro, 3-locellatis, 3-valvatis.

A glabrous tree attaining a height of at least 14 m, the young buds somewhat pubescent. Branches terete, brownish. Leaves alternate, coriaceous, generally oblong-obovate, 11 to 18 cm long, 4 to 8 cm wide, apex obtuse to obtusely acuminate, narrowed below to the cuneate base, when dry pale or yellowish on the upper surface, the lower surface more or less cupreous, glandular-punctate; lateral nerves about 12 on each side of the midrib, rather prominent, irregular, anastomosing with the marginal nerves, the reticulations lax; petioles about 5 mm long. Inflorescences axillary, about 12 cm long, simple or forked, racemose, few-flowered, supplied with numerous, lanceolate, coriaceous, leaf-like bracts 1.5 to 2 cm in length. Flowers white, about 3.5 cm in diameter, the pedicels 5 mm long or less. Calyx-tube shallow, 1 to 1.2 cm in diameter, the lobes spreading, persistent, ovate-lanceolate, acuminate, about 9 mm long. Petals orbicular-obovate, rounded, 1.3 to 1.5 cm long. Stamens about 25, 1-seriate on the prominent disk which is about 1 cm in diameter. Ovary 3-celled; style 13 mm long. Capsule about 1 cm in diameter, sugblobose, sometimes slightly 3-lobed, 3-celled, 3-valved, brown when dry; seeds very numerous, flat, thin.

LUZON, Camarines Province, Paracale, *For. Bur. 26500 de Mesa & Magistrado*, on low hills, altitude about 30 meters.

The same species is represented by a sterile specimen from Mambulao, *For. Bur. 13350 Aguilar*, and from Samar, *For. Bur. 25961 Cortes*. It is known in Camarines Province as *diricalin*, and in Samar as *bagoadlao*. The wood is hard and in Camarines Province it is considered to be one of the most durable building timbers. The species is very distinct from the two other Philippine forms, and does not appear to be closely allied to any of the described extra-Philippine ones.

SYMPLOCACEAE

SYMPLOCOS Jacquin

SYMPLOCOS OBOVATIFOLIA sp. nov.

Arbor glaberrima, 5 ad 10 m alta; foliis coriaceis vel subcoriaceis, obovatis ad anguste obovatis, usque ad 12 cm longis, nitidis, subintegris vel obscure crenulato-denticulatis, apice rotundatis ad breviter obtuse acuminatis, basi cuneatis vel acutis, nervis utrinque 6 vel 7, plus minusve adscendentibus, subtus perspicuis; fructibus numerosis, axillaribus, solitariis vel fasciculatis, oblongis, cylindraceis, 1 cm longis, calycibus lobis 3, ovatis, obtusis.

An entirely glabrous tree (flowers not seen), 5 to 10 m high. Branches brownish, terete, smooth, the branchlets greenish-olivaceous, somewhat angled when dry. Leaves alternate, coriaceous or subcoriaceous, greenish-yellow, of the same color on both surfaces and shining when dry, obovate to narrowly obovate, 8 to 12 cm long, 3.5 to 6 cm wide, apex rounded to shortly and obtusely acuminate, below generally narrowed to the acute or cuneate base, the margins entire or very obscurely and distantly crenulate-dentate; lateral nerves 6 or 7 on each side of the midrib, prominent, more or less ascending, anastomosing, the reticulations lax; petioles stout, about 1 cm long. Fruits axillary and in the axils of fallen leaves, solitary or fascicled, or subspicately arranged on the very short axis, sessile, oblong, cylindric, 3-celled, 1 cm long, smooth, the basal bracteoles broadly ovate, obtuse, 2.5 mm long, glabrous; calyx-lobes crowning the fruit three, ovate, obtuse, 1.5 to 2 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26447* (type), *26466 Ramos & Edaño*, August 11 and 15, 1916, on forested slopes, altitude between 250 and 400 meters.

A most characteristic species, readily distinguished by being entirely glabrous, and by its obovate or narrowly obovate leaves; its numerous, sessile, oblong, cylindric fruits; and its 3-merous calyx, the latter a character apparently new, or at least very rare, in the genus.

SYMPLOCOS TRISEPALA sp. nov. § *Babua, Lodhra.*

Arbor parva, partibus junioribus et foliis subtus ad costa parcissime longe ciliatis exceptis glabra; foliis oblongo-ellipticis ad oblongo-ovatis, coriaceis, usque ad 10 cm longis, acuminatis, basi obtusis, margine distanter glanduloso-denticulatis, nervis utrinque circiter 7, subtus perspicuis; spicis axillaribus, glabris, dense paucifloris, 1 ad 1.5 cm longis; calycibus tubo brevissimo, lobis 3, ovatis, obtusis, circiter 3 mm longis.

A small tree, entirely glabrous except for the widely scattered, long, ciliate hairs on the very youngest parts, petioles, and midribs on the lower surface of the leaves, perhaps ultimately entirely glabrous. Branches terete, reddish-brown, the branchlets greenish-olivaceous, somewhat compressed. Leaves oblong-ovate to oblong-elliptic, coriaceous, 7 to 10 cm long, 3 to 4.5 cm wide, yellowish-green when dry, shining, the apex distinctly and rather sharply acuminate, base obtuse, margins distantly glandular-denticulate, the gland-like teeth small, black when dry; lateral nerves 7 on each side of the midrib, very prominent on the lower surface, anastomosing, the reticulations lax, prominent, the midrib impressed on the upper surface; petioles 2 to 2.5 cm long. Spikes axillary, solitary, glabrous, 1 to 1.5 cm long, the flowers rather few, densely arranged, the subtending bracteoles ovate to elliptic-ovate, obtuse, coriaceous, 3 to 4 mm long, their margins glandular-denticulate. Flowers white or somewhat yellowish. Calyx-tube 1.5 mm long, the lobes 3, broadly ovate, obtuse, about 3 mm long. Petals 5, broadly ovate to elliptic-ovate, 3.5 to 4 mm long. Stamens about 50, obscurely pentadelphous, the filaments glabrous, 3 to 7 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26515 Ramos & Edaño*, September 6, 1916, in forests, altitude at least 400 meters.

It is very curious that two very distinct species of *Symplocos* should be collected on the same mountain both aberrent within the genus in their 3-lobed calyces. The present species is immediately distinguishable from *Symplocos obovatifolia* Merr. in numerous characters, notably in its entirely differently shaped leaves; its sparse ciliate indumentum; and its spicately arranged flowers.

SYMPLOCOS ELLIPTIFOLIA sp. nov. § *Bobua, Lodhra.*

Frutex circiter 3 mm altus, ramulis junioribus foliis subtus ad costa et inflorescentiis exceptis glaber; foliis subcoriaceis, ellipticis, usque ad 4 cm longis, utrinque acutis vel apice subobtusis minutissime apiculatisque, margine crenato-serrulatis, nervis utrinque 5 vel 6, distinctis, anastomosantibus; spicis axillaribus, pubescentibus, solitariis, 1 ad 1.5 cm longis, circiter 10 floris; calycibus tubo glabro, lobis ovatis, obtusis, margine ciliatis; petalis elliptico-ovatis, circiter 3 mm longis; staminibus circiter 60, obscure pentadelphis.

A shrub about 3 m high, glabrous except the ferrugineous-pubescent young branchlets, inflorescences, and the sparsely pubescent midrib on the lower surface of the leaves. Branches terete, smooth, dark reddish-brown. Leaves elliptic, subcoriaceous, 3 to 4 cm long, 1.4 to 2.4 cm wide, subequally narrowed to the acute base and the acute or subobtuse and minutely apiculate apex, margins crenate-serrulate, the upper surface brownish-olivaceous when dry, shining, the lower surface paler, yellowish-green, the midrib slightly impressed on the upper surface; lateral nerves 5 or 6 on each side of the midrib, slender, distinct, anastomosing, these and the rather lax reticulations subequally prominent on both surfaces, the midrib slightly pubescent on the lower surface. Spikes axillary, solitary, up to 1.5 cm long, about 10-flowered, appressed ferrugineous-pubescent; bracteoles ovate, pubescent, obtuse, about 1 mm long. Calyx-tube glabrous, cylindric, slightly enlarged upward, about 2 mm long, the lobes 5, ovate, 2 mm long, their margins ciliate, otherwise glabrous. Petals elliptic-ovate, rounded, 3 to 3.5 mm long. Stamens about 60, obscurely pentadelphous.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26512 Ramos & Edaño*, September 6, 1916, in forests, altitude at least 300 meters.

This species somewhat resembles *Symplocos inconspicua* Brand, but has very differently shaped, fewer-nerved leaves, and differs also in its ciliate calyx-segments. From *Symplocos vidalii* Rolfe (*S. luzoniensis* Brand, non

Rolfe) it differs in its shorter, more numerously flowered spikes and ovate, not lanceolate, bracteoles and calyx-segments.

SYMPLOCOS RAMOSII sp. nov. § *Bobua.*

Arbor, ramulis junioribus et inflorescentiis ferrugineo-pubescentibus exceptis glabra; foliis oblongo-ellipticis ad elliptico-ovatis, usque ad 12 cm longis, chartaceis, apice perspicue acuminatis ad subcaudato-acuminatis, basi acutis, margine obscure crenulato-dentatis, nervis utrinque 10 ad 12; inflorescentiis axillaribus pseudo-terminalibusque, elongatis, parce ramosis, ramulis plerumque 1 ad 3, usque ad 10 cm longis; floribus 5-meris, sessilibus, numerosis, circiter 8 mm diametro.

A tree, glabrous except the ferruginous-pubescent younger branchlets and the inflorescences. Branches and older parts of the branchlets brown, smooth, terete. Leaves scattered, chartaceous, oblong-elliptic to elliptic-ovate, subequally narrowed at both base and apex, the base acute, the apex rather prominently acuminate, sometimes subcaudate-acuminate, margins crenate-dentate, the teeth not prominent, when dry yellowish-green or greenish-olivaceous, of the same color on both surfaces, shining; lateral nerves 10 to 12 on each side of the midrib, rather slender but prominent on the lower surface, anastomosing; petioles 1.3 to 2 cm long, blackish when dry. Inflorescences elongated, axillary and pseudo-terminal, up to 12 cm in length, rather densely appressed-ferruginous-pubescent with short hairs, the branches few, usually 1 to 3, up to 10 cm in length. Flowers 5-merous, numerous, spicately arranged, white, about 8 mm in diameter, the subtending bracteoles three, broadly ovate, pubescent, obtuse to subacute, about 1.5 mm long. Sepals 5, broadly orbicular-ovate, obtuse, pubescent, 1.5 mm long. Petals elliptic to elliptic-ovate, rounded, about 3 mm long. Stamens about 40, obscurely pentadelphous, their filaments 3 to 5 mm long.

LUZON, Laguna Province, San Antonio, *Bur. Sci. 23801 Ramos,* October 18, 1915, on open hillsides at medium altitudes.

The alliance of this species is apparently with *Symplocos ahernii* Brand, from which it differs in numerous characters, notably in its greatly elongated spikes.

ERICACEAE

VACCINIUM Linnaeus

VACCINIUM MYRTOIDES (Blume) Miq. Fl. Ind. Bat. 2 (1859) 1062.

Thibaudia mytoides Blume Bijdr. (1826) 861.

Vaccinium villarii Vid. Rev. Pl. Vasc. Filip. (1886) 166; Merr. in Philip. Journ. Sci. 3 (1908) Bot. 374.

The type of Blume's species was from the Moluccas: "in cacumine montium ignivomorum insularum Moluccarum", and all published descriptions of it are very short and imperfect. *Koorders 19438, 19429* from Klabat and Sepoetan, Celebes, exactly match our very full series of Philippine *Vaccinium villarii* Vid., and as the specimens conform with Blume's diagnosis, I have no hesitation in reducing Vidal's species to the much older *Vaccinium myrtoides* Miq. This adds another characteristic species to the already long list of those that are known only from the Philippines and Celebes, or from the Philippines and the Moluccas.

VACCINIUM PLATYPHYLLUM sp. nov.

Frutex vel arbor parva inflorescentiis exceptis glabra; foliis ellipticis ad oblongo-ellipticis, usque ad 14 cm longis et 7 cm latis, crasse coriaceis, integris, in siccitate pallidis, nitidis, basi acutis, apice prominente acuminatis, nervis utrinque 4 vel 5, tenuibus, adscendentibus; racemis axillaribus, solitariis, parce pubescentibus, 4 ad 6 cm longis, bracteis oblongo-lanceolatis, acuminatis, circiter 8 mm longis, supersistentibus; corolla circiter 5 mm longa, extus leviter pubescentibus; ovario pubescente; calycibus lobis acutis, 1.2 mm longis, extus pubescentibus.

A shrub or small tree, glabrous except the inflorescence. Branches pale-brownish, terete, smooth, the younger branchlets reddish-brown, somewhat angular, rather stout. Leaves alternate, rather distant, thickly coriaceous, stiff, elliptic to ovate- or oblong-elliptic, 11 to 14 cm long, 5 to 7 cm wide, entire, rather pale when dry, base acute, apex prominently acuminate, the acumen rather broad, 1 to 1.5 cm long; lateral nerves 4 or 5 on each side of the prominent midrib, slender, ascending, mostly leaving the midrib in the lower one-third, obscurely anastomosing, the reticulations not prominent; petioles stout, about 1 cm long. Racemes axillary, solitary, 4 to 6 cm long, sparingly pubescent, the bracts subpersistent, oblong-lanceolate, acuminate, about 8 mm long, black when dry. Pedicels about 7 mm long, slightly pubescent. Corolla 5 mm long, externally sparingly pubescent, narrowed upward, the mouth about 1.5 mm in diameter, the short, broadly ovate, obtuse lobes recurved. Anthers 1.5 mm long. Ovary pubescent. Young fruit cup-shaped, 3 mm long, pubescent, the persistent calyx-teeth triangular-acute, 1.2 mm long.

LUZON, Tayabas Province, vicinity of Dingalan on the Pacific coast, *Bur. Sci. 26583 Ramos & Edaño*, August 25, 1916, on slopes at an altitude of about 200 meters.

This is perhaps as closely allied to *Vaccinium perrigidum* Elm., as to any other described species. It is characterized by its large, faintly and obliquely nerved leaves, and its slightly pubescent racemes.

VACCINIUM ANGUSTILIMBUM sp. nov.

Frutex glaber, circiter 3 m altus; foliis coriaceis, lanceolatis ad oblanceolatis, integris, usque ad 6 cm longis et 1 cm latis,

nitidis, utrinque subaequaliter angustatis, apice obtusis ad leviter acuminatis, basi cuneatis, tenuiter 3-nerviis, nervis lateralibus adscendentibus, margine revolutis; petiolo crasso, brevissimo; racemis terminalibus, solitariis, sub fructu circiter 3 cm longis; fructibus globosis, 5 ad 6 mm diametro, dentibus ovatis, obtusis, 1 mm longis.

A glabrous shrub, about 3 m high, the branches terete, the branchlets brownish, obscurely angled or subterete. Leaves numerous, rather crowded, thickly coriaceous, stiff, lanceolate to oblanceolate, 4 to 6 cm long, 7 to 10 mm wide, subequally narrowed to the cuneate base and to the blunt to obscurely acuminate apex, margins entire, recurved, olivaceous when dry, the lower surface often brownish, glandular, the base slenderly 3-nerved, the lateral basal nerves extending one-half to two-thirds to the apex; lateral nerves, including the basal pair, 3 or 4 on each side of the midrib, slender, sharply ascending, the primary reticulations rather distinct; petioles stout, about 1 mm long. Racemes terminal, solitary, in fruit about 3 cm long, the pedicels up to 5 mm in length. Fruits globose, black when dry, 5 to 6 mm in diameter, the persistent calyx-teeth ovate, blunt, about 1 mm long.

LUZON, Tayabas Province, vicinity of Dingalan, *Bur. Sci. 26603 Ramos & Edaño,* September 10, 1916, in forests, altitude about 300 meters.

A characteristic species distinguishable by its narrow, thickly coriaceous, slenderly nerved leaves. It is perhaps as closely allied to *Vaccinium jagori* Warb. as any other described form, but is very different from Warburg's species.

EBENACEAE

MABA Forster

MABA MULTIBRACTEATA sp. nov. § *Rhipidostigma?*

Arbor parva, 4 ad 6 m alta, dioica, ramulis valde elongatis, usque ad 1 m longis, subpendulis, plus minusve adpresse hirsutis; foliis chartaceis vel subcoriaceis, oblongis, usque ad 20 cm longis, brevissime petiolatis, basi cordatis, apice acuminatis, subtus obscure puncticulatis, nervis utrinque circiter 10, perspicuis; floribus ♂ 3-meris, axillaribus, cylindraceis, 10 mm longis, fasciculatis; staminibus 8 vel 9, antheris glabris; fructibus sessilibus, ovoideo-ellipsoideis, 2.5 cm longis, obtusis, in siccitate brunneis, 4-locellatis; seminibus 4, albumine aequabile; bracteis numerosis, lanceolatis, hirsutis, 6 ad 12 mm longis.

A dioecious tree, 4 to 6 m high, the branches very long, subpendulous, the ultimate one up to 1 m in length, the younger branches, petioles, inflorescences, and to a much less degree the

leaves ferruginous-pubescent with short, stiff, appressed hairs. Leaves oblong, chartaceous to subcoriaceous, brown or subolivaceous when dry, 11 to 20 cm long, 3.5 to 8 cm wide, base rounded, cordate, apex somewhat acuminate, both surfaces with widely scattered hairs on the midrib and nerves, the lower surface obscurely puncticulate; petioles 2 to 3 mm long; lateral nerves about 10 on on each side of the midrib, prominent, anastomosing, the reticulations lax. Flowers crowded in axillary, dense, multibracteate fascicles, the bracts lanceolate, acuminate, prominently pubescent, persistent, 6 to 10 mm long. Staminate flowers cylindric, 10 to 11 mm long, externally densely appressed-pubescent. Calyx 4.5 mm long, pubescent, 3-lobed, the lobes ovate, acuminate, about 2 mm long. Corolla lobes 3, elliptic-ovate, apiculate-acuminate, about 3 mm long, the median portion of the back pubescent, the broad margins glabrous. Stamens 8 or 9, inserted at the base, the longer filaments 2 mm long; anthers linear, glabrous, 2 mm long. Pistillate flowers not seen. Fruits ovoid-ellipsoid, obtuse, about 2.5 cm long, glabrous, sessile, brown and shining when dry, 4-celled, each cell with a single seed. Seeds oblong, pointed at both ends, about 1.8 cm long, triangular in cross-section, the two inner faces plane, the outer convex, the chartaceous testa dark-brown, free, somewhat puncticulate, the albumen very hard, pale-brownish, uniform, not at all ruminate.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 25641, 26361* (type) *Ramos & Edaño*, August, 1916; Sangirin, Alabat Island, *Merrill 10441*, December, 1916; Basiad, *Bur. Sci. 25592 Yates*, December, 1916, along small streams in forests at low altitudes.

A characteristic species that by definition might almost as well be placed in *Diospyros* as in *Maba*. On account of its trimerous flowers and its apparently alliance with *Maba punctata* Hiern, I have placed it in the latter genus. It is readily recognized by its nearly sessile cordate leaves and dense, multibracteate fascicles.

LOGANIACEAE

GENIOSTOMA Forster

GENIOSTOMA LONGIPES sp. nov.

Frutex glaber, circiter 2 m altus, ramis teretibus, ramulis distincte 4-angulatis; foliis in siccitate nigris, ellipticis ad oblongo-ellipticis, chartaceis vel subcoriaceis, nitidis, utrinque subaequaliter angustatis, basi acutis, apice acutis vel leviter acuminatis, usque ad 7 cm longis, nervis utrinque 4 vel 5, distinctis; fructibus axillaribus, solitariis vel binis, longe pedunculatis, ovoideis vel subglobosis, in siccitate nigris, circiter 6 mm diametro.

A glabrous shrub, about 2 m high, the branches terete, grayish or brownish, the branchlets distinctly 4-angled. Leaves black when dry, shining, chartaceous to subcoriaceous, 5 to 7 cm long, 2 to 3 cm wide, elliptic to oblong-elliptic, subequally narrowed to the acute base and the acute or somewhat acuminate apex; lateral nerves 4 or 5 on each side of the midrib, slender, curved, obscurely anastomosing; petioles about 2 mm long; stipules broader then long, subacute. Fruits axillary, solitary or in pairs, globose or ovoid, black when dry, about 6 mm in diameter, their peduncles 2 to 2.5 cm long, with few scattered, minute bracts.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26536 Ramos & Edaño*, September 8, 1916, in forests, altitude about 300 meters, locally known as *bitig-bitig*.

A characteristic species, distinguishable by its long-peduncled solitary or paired fruits, the peduncles simple, 2 to 2.5 cm long. The other Philippine species have the flowers and fruits arranged in depauperate cymes. In vegetative characters the present species is nearest to *Geniostoma batanense* Merr., but differs totally in the characters of its infructescence.

THYMELAEACEAE

WIKSTROEMIA Endlicher

WIKSTROEMIA PACHYPHYLLA sp. nov.

Frutex glaber, circiter 3 m altus; foliis coriaceis vel subcoriaceis, olivacies, nitidis, late ellipticis, usque ad 7 cm longis et 5.5 cm latis, apice late rotundatis, basi late rotundatis interdum leviter cordatis; fructibus ellipsoideis, circiter 9 mm longis.

A glabrous shrub, about 3 m high, the branches and branchlets smooth, reddish-brown, terete, or the latter somewhat compressed. Leaves broadly elliptic, 6.5 to 7 cm long, 4.5 to 5.5 cm wide, broadly rounded at both base and apex, or the base sometimes slightly cordate, when dry olivaceous, shining, the lower surface slightly paler than the upper; lateral nerves about 8 on each side of the midrib, rather distinct on the lower surface, somewhat curved, anastomosing, the reticulations lax; petioles about 2 mm long. Fruits red, fleshy, when dry ellipsoid, about 9 mm long.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci. 25559 Yates*, December 14, 1916, in forests, altitude about 400 meters.

A species well characterized by its broadly elliptic, rounded, comparatively large leaves. In spite of the great differences in vegetative characters, its alliance seems to be with *Wikstroemia viridiflora* Meisn.

VERBENACEAE

CALLICARPA Linnaeus

CALLICARPA WEBERI sp. nov.

Arbor circiter 8 m alta, ramulis petiolis et inflorescentiis et subtus foliis densissime uniformiter stellato-pubescentibus, indumento ferrugineo vel subferrugineo; foliis subcoriaceis, ovatis ad elliptico-ovatis, integris, usque ad 14 cm longis, basi rotundatis ad acutis, apice obtusis ad breviter acute acuminatis, supra, costa exceptis, glabris, eglandulosis, brunneis, subtus uniformiter dense subferrugineo-tomentosis, vetustioribus foveolatis; cymis e axillis superioribus, longe pedunculatis, densifloris, calycibus densissime stellato-tomentosis, corollae tubo extus puberulo 4 mm longo.

A tree about 8 m high, the younger parts densely and uniformly ferruginous-pubescent with short stellate hairs, the indumentum on the older parts and on the lower surfaces of the leaves paler but equally dense. Branches terete, the younger branchlets obscurely angled. Leaves subcoriaceous, ovate to elliptic-ovate, 8 to 14 cm long, 5 to 8 cm wide, entire, base rounded to acute, apex obtuse to shortly and acutely acuminate, the upper surface smooth, shining, dark-brown or olivaceous-brown, eglandular, glabrous except the midrib and lateral nerves, these sometimes minutely stellate-pubescent, the lower surface very densely and uniformly stellate-pubescent with short, pale to ferruginous hairs, the glands not evident, the older leaves distinctly pitted or foveolate beneath; lateral nerves 7 on each side of the midrib, prominent, curved, the reticulations distinct; petioles 1.5 to 5 cm long. Cymes in the upper axils, about 8 cm long and up to 6 cm wide, long-peduncled, all parts densely pale- or ferruginous-pubescent, dichotomously branched, the purplish flowers densely crowded; peduncles about 5 cm long; bracts linear, 5 to 6 mm long, the bracteoles similar but much smaller; pedicels about 2 mm long. Calyx cup-shaped, densely stellate-pubescent, 2 to 2.3 mm long, truncate, the teeth 4, minute, obscure. Corolla-tube puberulent externally, 4 mm long, the lobes oblong, obtuse, 1.5 mm long; stamens 4, the anthers oblong, 3 mm in length, exserted.

BANCALAN, between Palawan and Balabac, *C. M. Weber*, September 26, 1916, altitude about 6 meters.

This species is an ally of *Callicarpa arborea* Roxb. and *C. maingayi* King & Gamble, differing from both, however, in many characters; and of the Philippine *Callicarpa magna* Schauer, differing from the latter in its smaller leaves, densely stellate-pubescent calyx, and puberulent corolla.

It is apparently most closely allied to *Callicarpa arborea* Roxb., but its cymes are much smaller and usually but once or twice forked; its leaves smaller and fewer nerved; its flowers larger; and its ovaries are slightly glandular but not tomentose.

CALLICARPA SUBINTEGRA sp. nov.

Arbor parva, 3 ad 5 m alta, partibus junioribus subtus foliis et inflorescentiis densissime subalbido- vel griseo-stellato-puberulis; foliis lanceolatis, chartaceis, usque ad 11 cm longis, tenuiter caudato-acuminatis, basi acutis, integris vel parcissime distanter denticulatis, supra olivaceis, glabris, nitidis, subtus albidis, nervis utrinque circiter 8, perspicuis, curvato-adscendentibus; cymis axillaribus, solitariis, dichotomis, pedunculatis, usque ad 2.5 cm longis et 4 cm latis; floribus in ramulis ultimis confertis, sessilibus vel brevissime pedicellatis, calycibus truncatis, extus dense albido-stellato-tomentosis.

A small tree, 3 to 5 m high, the younger parts, lower surface of the leaves and the inflorescences very densely and uniformly stellate-puberulent, the indumentum white or brownish-white. Branches terete, pale-brown, ultimately glabrous. Leaves lanceolate, chartaceous, 8 to 11 cm long, 1.5 to 2 cm wide, entire or the margins distantly and obscurely denticulate, base acute, apex slenderly caudate-acuminate, the upper surface olivaceous, smooth, shining, glabrous, or the midrib sometimes stellate-pubescent, the lower surface entirely covered with the very dense, pale indumentum, no glands evident; lateral nerves about 8 on each side of the midrib, curved-ascending, anastomosing, the primary reticulations distinct; petioles 1 to 1.5 cm long, densely stellate-puberulent. Cymes axillary, solitary, dichotomously branched, up to 2.5 cm long and 4 cm wide, all parts very densely stellate-puberulent, the peduncles 1 cm long or less, the bracts of the primary branches linear, up to 5 mm long, those of the secondary branches similar but shorter. Flowers densely crowded on the ultimate branchlets, sessile or subsessile. Calyx 1.5 mm in diameter, truncate or minutely and obscurely 4-toothed, externally densely pale puberulent. Corolla 2.5 mm long, glabrous, the lobes 4, broadly ovate, obtuse, 1 mm long. Anthers exserted, 1 mm long. Style glabrous, 4 mm long. Young fruit ellipsoid to obovoid, glabrous, 2.5 to 3 mm in diameter, black when dry.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26619 Ramos & Edaño*, August 25, 1916, on dry slopes, altitude about 200 meters, locally known as *marataringao*.

In some respects this species resembles *Callicarpa angusta* Schauer, from which it is readily distinguished by its denser indumentum, its entire or but slightly toothed leaves, fewer nerves, and longer petioles. Its true alliance is with *Callicarpa longipetiolata* Merr., from which it is at once distinguished by its differently shaped, narrow, caudate-acuminate leaves.

Var. **PARVA** var. nov.

A typo differt foliis minoribus, leviter acuminatis, haud caudato-acuminatis. Foliis 5 ad 7 cm longis, 1 ad 1.5 cm latis.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26465 Ramos & Edaño*, August 13, 1916, on forested slopes, altitude about 350 meters.

CALLICARPA ALBIDO-TOMENTELLA sp. nov.

Frutex circiter 2 m altus, ramulis et subtus foliis densissime albido-tomentellis vel puberulis; foliis lanceolatis, integris, membranaceis, usque ad 11 cm longis, supra glabris, brunneo-olivaceis, sursum angustatis, tenuiter acute acuminatis, basi angustatis, obtusis, interdum leviter inaequilateralibus, nervis utrinque 5 vel 6, tenuibus; cymis axillaribus, paucifloris, dichotomis, pedunculatis, 1.5 ad 2 cm longis; calycibus truncatis vel obscurissime 4-denticulatis, circiter 2 mm diametro, extus minute stellato-puberulo.

A shrub about 2 m high. Branches slender, terete, glabrous, grayish, the branchlets very densely and minutely grayish- or whitish-puberulent as is the lower surface of the leaves, the indumentum stellate. Leaves membranaceous, entire, lanceolate, 7 to 11 cm long, 1.5 to 2.5 cm wide, gradually narrowed upward to the slenderly and sharply acuminate apex, narrowed below to the obtuse base, the base on some leaves slightly inequilateral, the upper surface glabrous, brownish-olivaceous, slightly shining, the lower entirely covered with the minute indumentum; lateral nerves 5 or 6 on each side of the midrib, slender, ascending, impressed on the upper surface, the reticulations here lax, very obscure, entirely obscured by the indumentum on the lower surface; petioles densely stellate-puberulent, 4 to 5 mm long. Cymes axillary, 1.5 to 2 cm long, densely stellate-puberulent, slender, peduncled, dichotomous, few-flowered, the peduncle exceeding the primary branches; pedicels slender, 1 to 1.2 mm long, the bracteoles acicular, nearly as long as the pedicels. Fruits subglobose, purplish when fresh, about 2.5 mm in diameter, glabrous, the calyx shallow, 2 mm in diameter, truncate or very obscurely 4-denticulate, outside at the base densely stellate-puberulent with very short white hairs.

LUZON, Abra Province, Mount Posuey, *Bur. Sci. 26976 Ramos*, February 5, 1917, along small streams in forests, altitude about 120 meters.

A most characteristic species, distinguished by its white or grayish-white, very short, dense indumentum, and its entire, lanceolate, mem-

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branaceous leaves which are entirely glabrous on the upper surface. It somewhat resembles *Callicarpa angusta* Schauer, but is not closely allied to that species.

CALLICARPA PHANEROPHLEBIA sp. nov.

Frutex 1 ad 2 m altus, ramis ramulisque teretibus, partibus junioribus stellato-tomentosis; foliis chartaceis, lanceolatis vel oblongo-lanceolatis, usque ad 15 cm longis, supra glabris, nitidis, olivaceis, subtus brunneo-olivaceis, glandulosis, glabris vel ad costa stellato-tomentosis, apice tenuissime caudato-acuminatis, basi obtusis, margine perspicüe serrato-dentatis, nervis primariis utrinque circiter 7, curvato-anastomosantibus, valde prominentibus; cymis axillaribus, laxis, pedunculatis, usque ad 6 cm longis latisque, paucifloris.

A shrub about 2 m high, the younger parts distinctly stellate-tomentose with pale-brownish hairs, the older parts glabrous. Branches terete, brownish, glabrous, the branchlets very slender, the younger parts densely stellate-tomentose. Leaves lanceolate to oblong-lanceolate, chartaceous, 11 to 15 cm long, 2 to 4 cm wide, narrowed upward to the very slender, caudate-acuminate apex, the acumen 1 to 2 cm long, the base obtuse, margins prominently dentate-serrate, the teeth somewhat apiculate, the upper surface olivaceous, somewhat shining, glabrous, or the midrib somewhat stellate-tomentose, the lower surface brownish-olivaceous, shining, with very numerous, shining glands in minute pits, the midrib and sometimes the lateral nerves stellate-tomentose; lateral nerves about 7 on each side of the midrib, very prominent, curved-ascending, anastomosing, the reticulations lax, prominent; petioles stellate-tomentose, about 3 mm long. Cymes axillary, solitary, few-flowered, very lax, up to 6 cm long and wide, dichotomously branched, more or less stellate-tomentose, the peduncles 2 cm long. Flowers purplish, their pedicels 0.5 mm long, jointed to the branchlets. Bracts linear, 1 to 1.5 mm long. Calyx cup-shaped, truncate or very obscurely 4-toothed, 1.4 mm long and wide. Fruits globose, glabrous, wrinkled when dry, 3 mm in diameter.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26233 Ramos & Edaño*, August 8, 1916, in open places along streams, altitude about 50 meters.

A species well characterized by its slenderly caudate-acuminate, prominently toothed, nearly glabrous, very prominently nerved leaves, and its lax, few-flowered inflorescences. It is perhaps as closely allied to *Callicarpa dolichophylla* Merr. as to any other described species, but is entirely different in its vegetative and inflorescence characters.

PREMNA Linnaeus

PREMNA LEYTENSIS sp. nov.

Frutex circiter 3 m altus, partibus junioribus et inflorescentiis exceptis glaber, ramis teretibus, pallidis; foliis integris, ovatis ad oblongo-ovatis, subcoriaceis, in siccitate pallide brunneis, nitidis, usque ad 10 cm longis, prominente acute acuminatis, basi rotundatis, nervis utrinque circiter 5; inflorescentiis terminalibus, corymbosis, circiter 6 cm longis, laxis, calycis obscure bilabiatis lobis altero bidentato altero integro.

A shrub about 3 m high, the younger parts and the inflorescence more or less pubescent. Branches terete, pale-gray, glabrous. Leaves entire, ovate to oblong-ovate, subcoriaceous, when dry pale-brownish, somewhat shining, 6 to 10 cm long, 3 to 4 cm wide, narrowed upward to the prominently and sharply acuminate apex, the base rounded, entirely glabrous, or the lower surface slightly bearded in the axils; lateral nerves 5 on each side of the midrib, very prominent, curved-anastomosing, the reticulations lax; petioles 1 to 2 cm long. Inflorescence terminal, corymbose, distinctly ferruginous-pubescent with short hairs, up to 6 cm long and 10 cm wide, the primary branches few, spreading, the lower ones up to 5 cm long, the bracts linear, about 3 mm long, the bracteoles similar but smaller. Calyx cup-shaped, slightly ferruginous-pubescent, about 2 mm long, distinctly 2-lipped, one lip emarginate or broadly 2-toothed, the other entire. Corolla-tube somewhat pubescent externally, the throat bearded, about 4 mm long, 2-lipped, the upper lip entire, the lower 3-lobed, the central lobe somewhat larger than the two lateral ones, all rounded.

LEYTE, Tigbao, near Tacloban, *Wenzel 1364*, June 14, 1914, the flowers green and white.

A species in the group with *Premna integrifolia* Linn. f., but its leaves quite different in shape, prominently and rather sharply acuminate, and not at all olivaceous when dry.

CLERODENDRON Linnaeus

CLERODENDRON MABESAE sp. nov.

Species *C. minahassae* Miq. affinis, differt florbus multo longioribus, corollae tubo circiter 14 cm longo. Arbor parva, circiter 7 m alta, glabra; foliis oblongis ad oblongo-obovatis, submembranaceis, usque ad 36 cm longis, acuminatis, basi acutis, nervis utrinque circiter 10, prominentibus; inflorescentiis terminalibus, brevissime pedunculatis; calycibus circiter 4 cm longis, extus glandulosis, plus minusve inflatis, lobis anguste lanceolatis, acuminatis, circiter 2 cm longis.

A glabrous tree about 7 m high, the branches brownish, the ultimate branchlets somewhat 4-angled. Leaves oblong to oblong-obovate, submembranaceous, greenish or olivaceous and of the same color on both surfaces when dry, shining, minutely puncticulate on both surfaces, 30 to 36 cm long, 8 to 12 cm wide, entire or with very few, widely scattered, minute teeth, the apex acuminate, base acute; lateral nerves about 10 on each side of the midrib, prominent, curved, anastomosing, the primary reticulations very lax and prominent; petioles 4 to 5 cm long. Panicles terminal, about 10-flowered, the peduncle very short, including the rachis about 2 cm in length. Flowers white, fragrant. Calyx somewhat inflated, about 4 cm long, chartaceous, glandular-punctate externally, brownish when dry, somewhat angled, base cuneate, divided to about the middle into five, narrowly-lanceolate, acuminate lobes. Corolla-tube slender, about 12 cm long and 2 mm in diameter, the lobes spreading, lanceolate to oblanceolate, about 4 cm long, 5 to 7 mm wide.

LUZON, Laguna Province, forests back of Paete, *For. Bur. 26796 Mabesa*, March 27, 1917, on moist shaded slopes, altitude about 370 meters.

A remarkable species, manifestly allied to *Clerodendron minahassae* Miq., from which it differs in its much longer flowers.

THE PHILIPPINE JOURNAL OF SCIENCE, C. BOTANY.
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THE RATE OF GROWTH OF SOME TREES ON THE GEDEH, JAVA

By WILLIAM H. BROWN and HARRY S. YATES
(From the College of Liberal Arts, University of the Philippines and the Botanical Section of the Biological Laboratory, Bureau of Science, Manila)

A very excellent and complete method of labeling trees in a mixed tropical forest has been devised in Java by Dr. S. H. Koorders. The primary purpose of this scheme was to select and label fine typical specimens, of known diameter and height, so that they could be readily found and examined by any one interested in them. The system is so complete that any one visiting the area, even though for the first time and without a guide, should have no difficulty in finding any desired tree. Among the many areas, originally so labeled, is an extensive one on the Gedeh above the mountain station at Tjibodas. Doctor Koorders[1] has written a very full description of the labeled trees on this area.

While the writers were on a recent trip (1917) to Java, Doctor Koorders, knowing that one of us had made a large number of measurements of the rates of growth of trees in the Philippines, suggested that it would be interesting for us to remeasure some of his labeled trees on the Gedeh to ascertain how much they had grown in the twenty-seven years which had elapsed since they were first measured. As the time at our disposal was very short, we could measure only a small proportion of the trees. This was particularly so, as many of the trunks were overgrown with large vines. Moreover, it was not usually possible to determine accurately the rates of growth of the largest individuals as most of them had extensive buttresses which extended above the point where the measurements should have been made.

Doctor Koorders made the original measurements at breast height, or 1.3 meters above the ground. In order to obtain exact determinations of the rate of growth it would be necessary to be sure not only that the same point on the circumference was used for measuring the 1.3 meters above ground but also to know that the contour of the ground had not changed. Of the last we cannot, of course, be absolutely sure, and so there may be slight errors in our calculations, but we do not believe that there are any serious ones.

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[1] Koorders, S. H., Floristischer Überblick über die Blütenpflanzen des Urwaldes von Tjibodas auf dem Vulkan Gede in West-Java nebst einer Numerliste und einer systematischen Übersicht der dort für botanische Untersuchungen von mir numerierten Waldbäume, *Engl. Bot. Jahrb.* **50** (1914) Suppl. 278–303.

The forest on the Gedeh back of Tjibodas has a very irregular canopy. Doctor Koorders has made an extensive search for the tallest trees and found that the species attaining the greatest height was *Altingia excelsa,* one of the tallest individuals of which was 49 meters high. Most of the trees are, however, very much smaller than this. The tallest trees are found at the lower altitudes just back of Tjibodas. As higher elevations are reached the trees become much smaller until at the top of the mountain the canopy is only a few meters high. The forest at altitudes between 1,300 and 1,500 meters, where our measurements were made, is a fairly open one. Although the forest is tall for a mountain type, it has many of the characteristics of a tropical, high-mountain forest: among these are the prominence of species of *Podocarpus* and a considerable development of a mossy covering and other epiphytes. The relative humidity is constantly high and the rainfall is heavy. Von Faber[2] gives the rainfall and relative humidity for this forest for the years 1912–13. In 1912 the monthly rainfall varied from 256 to 398 millimeters, and in 1913 from 95 to 386 millimeters. The mean monthly relative humidity in 1912 varied between 93 and 98 per cent and in 1913 between 92 and 97 per cent.

In Table I is given a list of the trees measured on the Gedeh, including the height and diameter of each as originally determined by Doctor Koorders. In this same table we have calculated the annual rate of growth of these trees by subtracting the diameters as measured in 1890 from the figures obtained by us in 1917 and dividing the remainder by 27. The rates of growth are classified according to diameter classes of 10 centimeters, the classification being based on the diameter of the trees when the original measurements were made.

The trees labeled by Doctor Koorders were selected, not with an idea of obtaining rates of growth but to authentically label the best specimens of the individual species in the forest. As trees show different rates of growth at different ages we cannot, from our calculations, determine the age of any individual of a species or of the forest in general, nor can we tell whether or not the rates of growth obtained for the individual trees are

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[2] Von Faber, F. C., Physiologische Fragmente aus einem tropischen Urwald, *Jahrb. Wiss. Bot.* 56 (1915) 197–220.

TABLE I.—*Annual diameter growth of trees in the virgin forest on the Gedeh in Java at altitudes between 1,300 and 1,500 meters.*

Species.	Height.	Diameter.	Diameter class in centimeters.					
			10–20	20–30	30–40	40–50	50–60	60–70
Lauraceae.	*m.*	*cm.*						
Litsea mappacea (Bl.) Boerl	10	27.0		0.55				
Machilus rimosa Bl.	15	16.0	0.35					
Phoebe excelsa Nees	20	55.0					0.90	
Do	26	63.5						0.80
Leguminoseae.								
Pithecolobium montanum Benth.	15	18.0	0.35					
Meliaceae.								
Dysoxylum alliaceum Bl.	9	31.5			0.30			
Toona febrifuga Bl.	25	45.0				1.35		
Euphorbiaceae.								
Glochidion cyrtostylum Miq.	20	26.0		0.40				
Ostodes paniculata Bl.	15	35.0			0.25			
Macaranga rhizinoides (Bl.) Muell.-Arg.	20	30.0		0.20				
Aceraceae.								
Acer niveum Bl.	10	18.0	0.70					
Do	15	27.0		0.20				
Sapindaceae.								
Mischocarpus fuscescens Bl.	20	31.0			0.05			
Do	15	20.0			0.05			
Elaeocarpaceae.								
Elaeocarpus pierrei Kds. et Val.	18	23.0		0.60				
Sloanea sigun Szysz	18	32.0			0.10			
Theaceae.								
Eurya acuminata DC	18	21.0		0.30				
Schima noronhae Reinw.	35	55.0					0.40	
Myrtaceae.								
Eugenia cuprea Kds. et Val.	23	46.0				0.05		
Eugenia densiflora (DC.) Duthie.	15	28.0		0.20				
Do	15	34.0			0.35			
Eugenia operculata Roxb	21	44.5				1.00		
Myrsinaceae.								
Rapanea hasseltii (Bl.) Mez	26	21.0		0.60				
Symplocaceae.								
Symplocos costata (Bl.) Choisy	18	37.0			0.20			
Symplocos fasciculata Zoll.	8	10.0	0.20					
Do	14	18.0	0.35					
Rubiaceae.								
Nauclea lanceolata Bl.	23	23.5		0.15				
Average			0.39	0.36	0.19	0.80	0.65	0.80
Years in 10-centimeter diameter class.			26.0	28.0	53.0	13.0	15.0	13.0

fast or slow for the species concerned. Brown and Matthews[8] found that in the virgin forests of the Philippines some of the larger individual trees showed a slow rate of growth and others of the same species a rapid rate.

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[8] Brown, W. H., and Matthews, D. M., Philippine dipterocarp forests, *Philip. Journ. Sci.* A 9 (1914) 413–561.

Realizing the above objections, we have, in order to compare the data obtained from the trees on the Gedeh with those growing in other regions, treated them as though the age of the forest could be determined from them. To do this we have calculated the number of years required for the average of all the trees of a given diameter class to grow 10 centimeters or in other words to pass through the 10 centimeters diameter class. As the smallest diameter class was from 10 to 20 centimeters we calculated the age of the trees as beginning with a diameter of 10 centimeters, and by adding together the number of years required for trees to pass through the successive diameter classes, arrived at figures, which for purposes of comparison can be regarded as the ages of trees of given diameters of from 20 to 70 centimeters. These results are plotted in fig. 1 in which the ordinates represent diameters and the abscissae years. This treatment is justified to some extent by the fact that most of the trees are very much smaller than the maximum size given by Koorders[4] in his Exkursionsflora, while only one individual of one species, *Symplocos costata*, has obtained the maximum size. This individual, however, showed a faster rate of growth than the average of its diameter class.

In the same figure are also plotted the average rates of growth for a large number of species on Mount Mariveles, Philippine Islands, at altitudes between 400 and 500 meters and the average rates of growth of five representative species in the northern Laguna forest, Philippine Islands.[5] In the same figure we have plotted the rates of growth of yellow poplar in Virginia and Tennessee and of white oak in Tennessee and Kentucky.[6] The original figures for yellow poplar and white oak were in inches. In order to make these figures comparable with our results, we converted the inches into centimeters and plotted them on coordinate paper. From these curves we obtained the numbers used in plotting the curves in figure 1.

An examination of figure 1 shows that the rates of growth obtained on the Gedeh are not very different from those for white oak and yellow poplar and for the species in the forest of northern Laguna. The figures obtained for rates of growth on the Gedeh cannot, of course, be regarded as final, except for the particular individuals and for these only for the period covered by the measurements. However, as most of the curve for rates of growth on the Gedeh lies between those for yellow poplar and white oak, it seems not improbable that the trees on the Gedeh

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[4] Koorders, S. H., Exkursionsflora von Java (1911–1912).

[5] Brown, W. H., and Matthews, D. M., op. cit.

[6] Graves, H. S., and Ziegler, E. A. The woodman's handbook, *U. S. Forestry Service Bull.* 36 (1910) 189, 190.

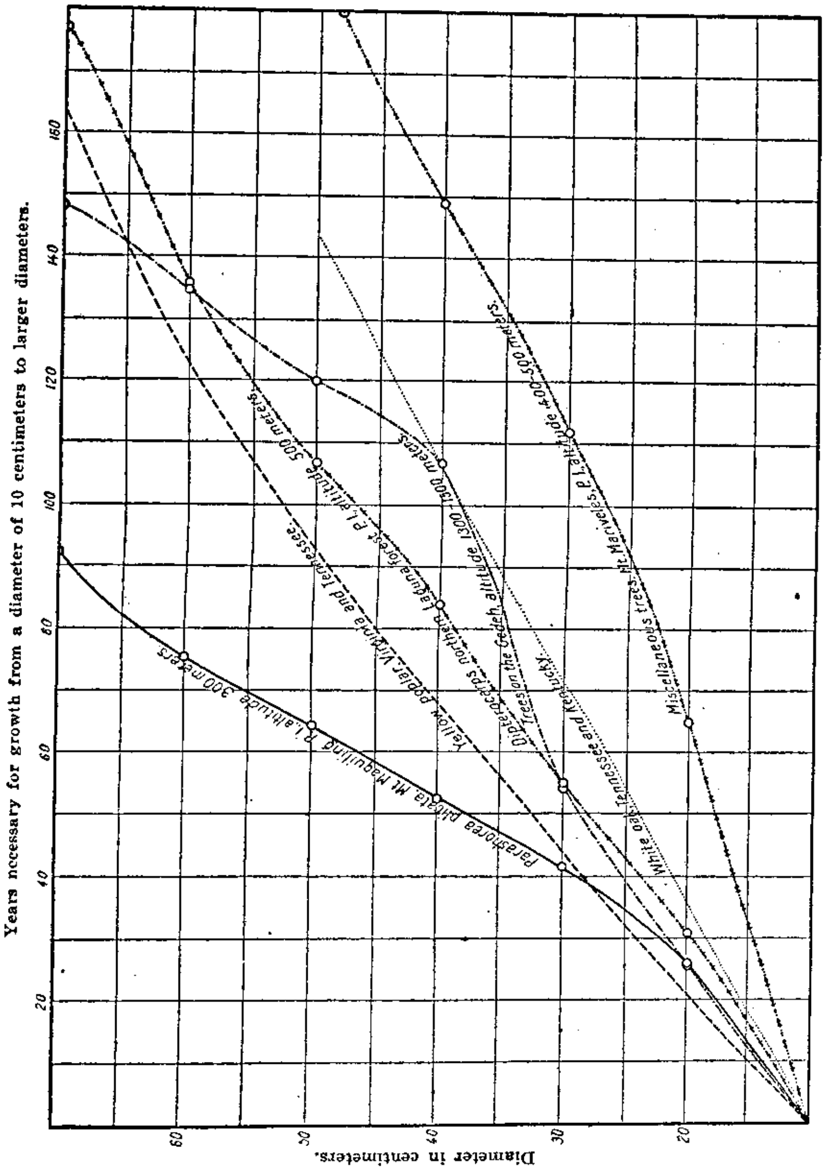

FIG. 1. Comparison of the rates of growth of trees on the Gedeh, Java, with those for trees in other regions.

have rates of growth about equal to those of hardwoods in the central deciduous forest region of the United States. Brown and Matthews have previously shown that the dipterocarps, which are the dominant trees at low altitudes in the Philippines, also show similar rates of growth and have pointed out that the rates of growth of the dipterocarps in the Philippines are similar to those of *Shorea robusta* in India.

The great density of the stands in the dipterocarp forests of the Philippines seems to account for the fact that the trees do not grow faster than those in the central hardwood region in the United States. *Parashorea plicata,* on Mount Maquiling, Philippine Islands (figure 1), growing in a rather open stand for a dipterocarp forest, shows much more rapid rates of growth than the average rate for dipterocarps. In Kurseong District, Bengal[7] where the altitudes are low and moisture conditions favorable, *Shorea robusta* grows much more rapidly than in many other districts; the rates of growth being slightly faster than those for *Parashorea plicata* on Mount Maquiling. Caccia found that the rates of growth of *Shorea robusta* decreased at higher altitudes. Brown and Matthews also found that the same was true of trees in the dipterocarp forests of the Philippines. It is a well-known fact that in the tropics, as high altitudes are reached, the trees become very much dwarfed. This dwarfing is due to factors incident to high altitudes, but as the intensity of these factors varies at the same altitudes in different regions, it is not surprising that the degree of dwarfing is by no means proportional to the altitude. On Mount Maquiling at an altitude of 1,050 meters the trees are about 10 meters high, while on the Gedeh at an elevation above 1,300 meters, Doctor Koorders measured a tree 49 meters high. The forest on the Gedeh is more open than the average dipterocarp forest in the Philippines, which might be expected to result in faster rates of growth. On the other hand, the elevation is considerably greater and this is probably accompanied by factors which retard the rates of growth. The large size attained by the trees would, however, indicate that this retarding effect is not nearly so great as in many other regions at the same altitude.

SUMMARY

The rates of growth of the trees on the Gedeh, in the limited number of cases measured, would indicate that these trees grow about as rapidly as the dominant trees in the Philippines, *Shorea robusta* in India, and hardwoods in the central hardwood regions of the United States.

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[7] Caccia, A. M. F. A preliminary note on the development of sal in volume and in money-value, *Indian Forest Records* 1 (1908) 1–238.

ILLUSTRATION

TEXT FIGURE

FIG. 1. Comparison of the rates of growth of trees on the Gedeh, Java, with those for trees in other regions.

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FUNGI COLLECTED BY E. D. MERRILL IN SOUTHERN CHINA

By HARRY S. YATES

(*From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila*)

The present paper is based upon a small collection of fungi made by Mr. E. D. Merrill while in Kwantung Province, southern China in October and November, 1916. A number of additional specimens were collected, but these were in an immature condition and consequently exact identification has not been possible. The number of specimens considered is too small to indicate very much regarding the composition of the fungus flora of Canton and vicinity. Many of the fungi collected are widely distributed and well-known forms. The rather high proportion of *Uredinaceae* is perhaps suggestive, because in the Philippines the rust fungi are relatively uncommon. It is possible however, that collections made at other seasons of the year would show a much smaller percentage of rusts as the abundance of *Uredinaceae* in a locality often varies greatly from season to season. The presence in the collection of only one of the *Perisporiaceae* is also in rather marked contrast to the relatively great abundance of this group in the Philippine fungus flora where often one-half the lower fungi in a collection belong in this group.

BACTERIACEAE

PSEUDOMONAS Migula

PSEUDOMONAS CITRI Hasse in Journ. Agric. Research 4 (1915) 99.

Kwangtung Province, Canton (Honam Island), *Merrill 10393*, October 1916, on leaves of *Citrus* sp.

The bacterium responsible for the Citrus canker was not found but the general appearance of the infected areas on the leaves is that of this well known organism.

PERISPORIACEAE

PARODIELLA Spegazzini

PARODIELLA PERISPORIOIDES (B. & C.) Speg. in Anal. Soc. Cient. Arg. 9 (1880) 178.

Dothidea perisporioides B. & C. in Grev. 4 (1876) 103.

Kwangtung Province, Canton (Honam Island), *Merrill 10392*, October 23, 1916, on leaves of *Desmodium triflorum*.

PHYLLACHORACEAE

TRABUTIA Saccardo et Roumeguere

TRABUTIA CHINENSE sp. nov.

Stromatibus epiphyllus, in maculis decolorantibus 1–2 mm diam. vel aggregatis et gregis convexulis atris irregularibus usque 1 cm diametro efformante; loculis 1 ad 3, lenticularibus, 250–400μ diam., 100–125μ altis; ascis clavatis, ad apicem rotundatis, octosporis, 60–70 x 18–20μ, breviter stipitatis, paraphysibus filiformibus; sporidiis oblique 1-2-stichis, ellipsoideis, unicellularis, hyalinis, 16–18μ longis, 8–9μ latis.

Kwangtung Province, Loh Fau Mountain (Lofaushan), *Merrill 10410*, October 29, 1916, on leaves of *Ficus* sp.

PHYLLACHORA Nitschke

PHYLLACHORA COICIS P. Henn. in Hedwigia **34** (1895) 12.

Kwangtung Province, Canton (Honam Island), *Merrill 10402*, November 9, 1916, on leaves of *Coix lachryma-jobi.*

PHYLLACHORA CYNODONTIS (Sacc.) Niessl. in Not. Pyren. (1876) 54.

Physalospora cynodontis Delacr. in Bull. Soc. Myc. Fr. **6** (1890) 183.

Kwangtung Province, Canton (Honam Island), *Merrill 10388*, October 26, 1916, on leaves of *Cynodon dactylon.*

PHYLLACHORA ORBICULA Rehm in Elm. Leaf. Philip. Bot. **6** (1914) 2221.

Kwangtung Province, Canton (Honam Island), *Merrill 10405*, November 3, 1916, on leaves of *Bambusa blumeana.*

PUCCINIACEAE

PUCCINIA Persoon

PUCCINIA CYNODONTIS Desm. Exs. III, No. 655; Fuckel, Syn. Myc. Nacht. **1** (1871) 296; Sydow, Monograph Ured. **1** (1904) 748.

Kwangtung Province, Canton (Honam Island), *Merrill 10384*, October 26, 1916, on leaves of *Cynodon dactylon.*

I have not been able to locate the original description of this species, but a diagnosis is to be found in Sydow's Monograph of the Uredinaceae.

PUCCINIA HETEROSPORA B. & C. in Journ. Linn. Soc. Bot. **10** (1868) 356.

Kwangtung Province, Canton (Honam Island), *Merrill 10391*, November 2, 1916, on leaves of *Prunus persica.*

UREDO Persoon

UREDO CANTONENSIS sp. nov.

Soris uredosporiferis hypophyllus, punctiformibus, mox nudis, brunneis, 0.25–0.33 mm diam.; uredosporis globosis vel subglobosis, echinulatis, brunneis, 22–26 x 16–20μ, episporio ca. 1–2μ crasso, poris germinationis 1–3; pedicellis hyalinis, 20–50μ longis, 5–6μ latis.

Kwangtung Province, Canton (Honam Island), *Merrill 10386*, November 3, 1916, on leaves of *Melothria indica.*

This species is one of the few belonging to this genus occuring upon the *Cucurbitaceae.* It appears to be very close to the uredo form of *Uromyces Hellerianus* Arth., described from material from Porto Rico on *Cayaponia racemosa.* No teleutospores have however been found in our material and so it must be described as a *Uredo.*

Uromyces melothriae P. Henn., which according to Sydow is merely a uredo form, differs from our species chiefly in its much larger spore measurements. It was originally described from Abyssinia on *Melothria tomentosa.*

UREDO PHILIPPINENSIS Syd. in Ann. Myc. 4 (1906) 32.

Kwangtung Province, Canton (Honam Island), *Merrill 10404*, October 25, 1916, on leaves of *Cyperus* sp.

UROMYCES Link

UROMYCES LINEARIS B. et Br. in Journ. Linn. Soc. Bot. 14 (1875) 92.

Kwangtung Province, Canton (Honam Island), *Merrill 10401*, October 25, 1916, on leaves of *Panicum repens.*

USTILAGINACEAE

USTILAGO Persoon

USTILAGO CYNODONTIS P. Henn. in Engl. Bot. Jahr. 14 (1891) 369.

Kwangtung Province, Canton (Honam Island), *Merrill 10403*, October 23, 1916, on inflorescences of *Cynodon dactylon.* Also *Levine 761*, May 5, 1917, on the same host.

USTILAGO KOORDERSIANA Bref. Untersuchung. 12 (1895) 132.

Kwangtung Province, Canton (Honam Island), *Merrill 10403*, October 21, 1916, on inflorescences of *Polygonum* sp.

DEMATIACEAE

CERCOSPORA Fresen

CERCOSPORA PERSONATA (B. et C.) Ellis in Journ. Myc. 1 (1885) 63.

Cladosporium personatum B. et C. in Grev. 3 (1875) 106.

Kwangtung Province, Canton (Honam Island), *Merrill 10387*, October 20, 1916, on leaves of *Arachis hypogaea.*

Cercospora personata is the cause of a serious disease of the peanut in the West Indies. It has also been reported from the United States and India, and is abundant on the leaves of peanuts in the Philippines. It is very similar to, and may be identical with, *Septogloeum arachidis* Rac., which causes a very serious disease of peanuts in Java. *Septogloeum arachidis* has also been reported from Ceylon.

HELMINTHOSPORIUM Link

HELMINTHOSPORIUM RAVENELII Curt. in Am. Journ. Sci. Arts II 6 (1848) 352.

Kwangtung Province, Canton (Homan Island), *Merrill 10400*, October 23, 1916, on inflorescences of *Sporobolus elongatus*.

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